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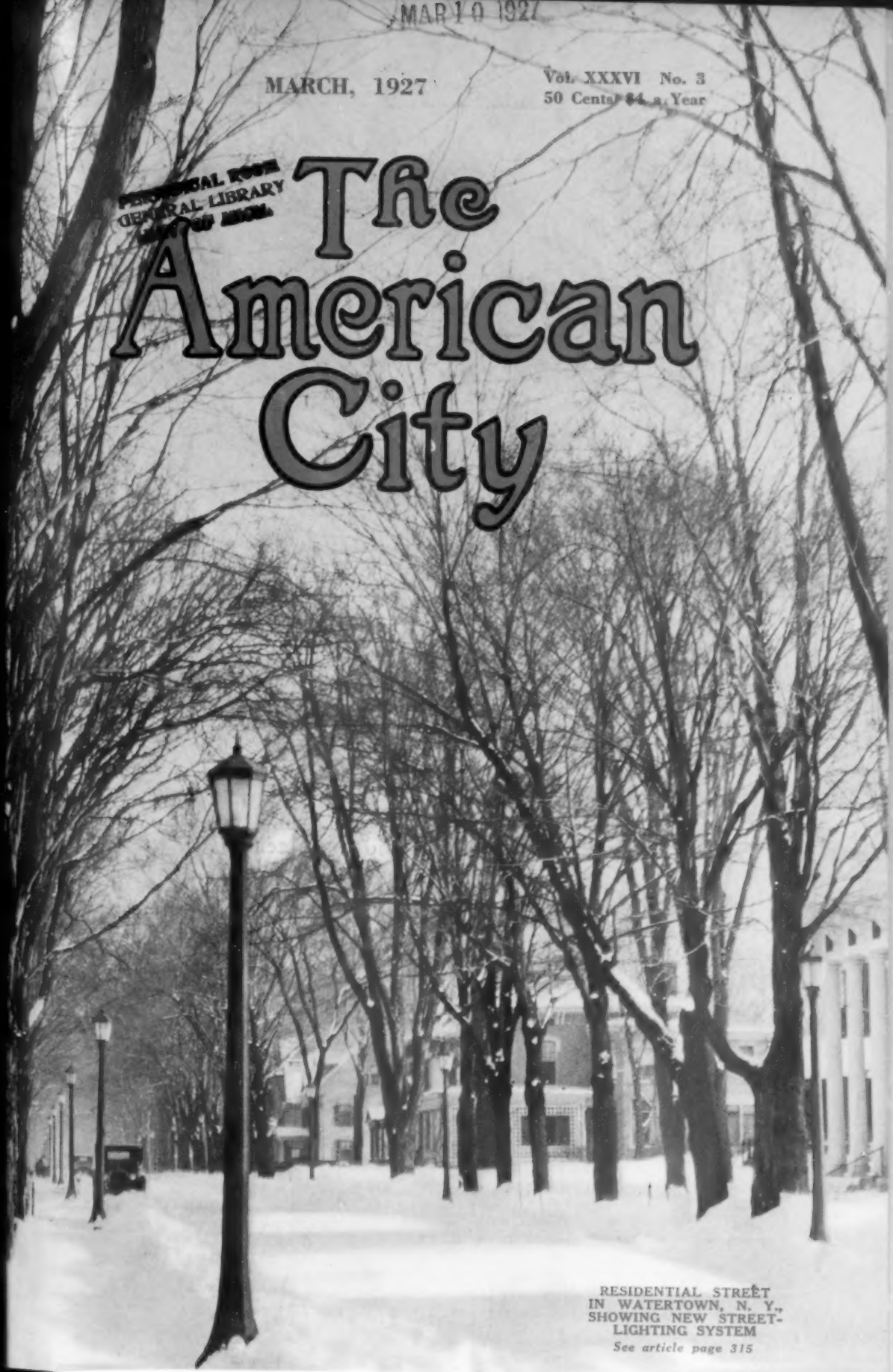

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See article page 315

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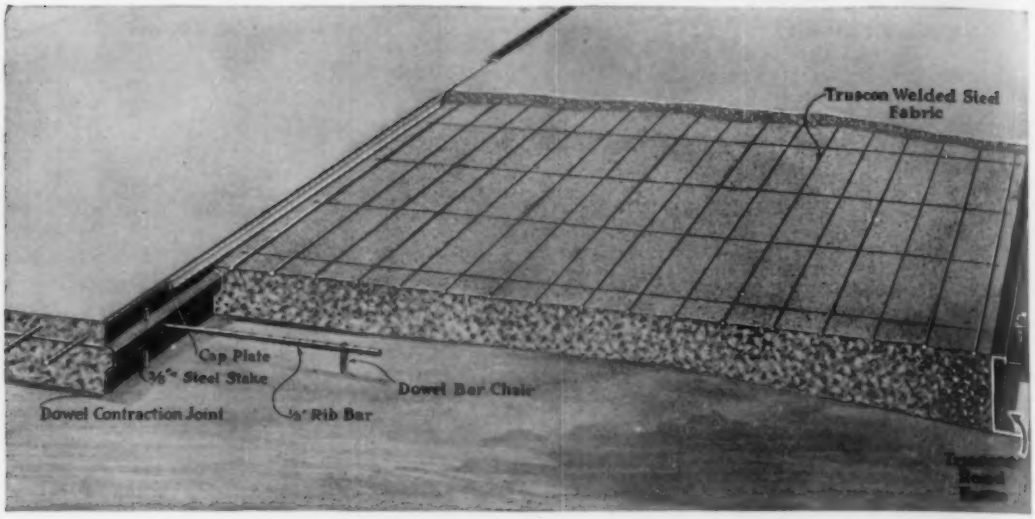

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How a Self-contained Neighborhood Unit Might Be Planned

By Robert Whitten
City Planning Consultant, New York

IT may be predicted that there are comparatively few American cities that will not see at least a doubling of their built-up residential area within the next 50 years. The great city planning opportunity is in the wise direction and control of this inevitable expansion. Every city should make plans for the expansion of its residential area.

While detailed planning should not go on much in advance of actual subdivision and development, it is desirable to fully plan each tract of 160 acres more or less that is bounded on all sides by main thoroughfares laid down in the master plan, before a plat for the subdivision of any part of the 160-acre tract is approved for subdivision into building lots. Each one of these larger tracts should be planned as a unit, with adequate provision for a complete neighborhood life. Small parks, playgrounds, and school sites should be located. One or more shopping centers should be laid out. The local streets should be so arranged as not to invite through traffic. This will not only reduce pavement standards and costs, but will also reduce traffic accidents. In order to fix street improvement standards on the most economical basis, it will also be necessary to determine the housing density that is to be allowed in this neighborhood unit. Housing density is a fundamental factor that should influence or control the quality and width of paved roadways as well as the design of sidewalks, curbs, gutters, storm-water drainage, sanitary sewers, water-mains and other utilities. Without a predetermination of housing density, the city's standard requirements for the construction of improvements and utilities must necessarily be based on the maximum density that may reasonably be anticipated.

Statement of the Problem

This research has been undertaken with two main objects in mind:

1. That of throwing some light on the question whether the single-family detached house is an economically sound type of housing for families having an income of $1,800 to $2,500.

2. That of aiding in the solution of the question of whether it is economically feasible in the subdivision of land for low- or medium-cost housing to create a self-contained neighborhood with provision for small parks, playgrounds, public school, community center, and shopping center, and with careful attention to the amenities.

Clarence A. Perry, of the Department of Recreation of the Regional Plan of New York and its Environs, summarizes neighborhood unit principles as follows:

"Our study leads then to the conception of a special plan for a neighborhood district. It can be regarded as a somewhat elastic pattern for laying out unit districts in new or replanned urban residential sections. Its desirable size may be defined, in general terms, as that populated area for which one elementary school should be provided. In sections where single-family-per-lot housing is the rule, this means an area of about 160 acres and a population of 5,000 or 6,000 people. It has school and institutional sites suitably grouped around a civic center, and shopping districts at the traffic intersections in its periphery. It is bounded and walled in by arterial highways and enjoys a special street system of its own which provides direct circulation within the unit but does

not invite traffic *through* it. The interior is restricted entirely to residential use and, ideally, about ten per cent of its area is devoted to small parks and recreational spaces."

Essentials of a Good Neighborhood Environment

The purpose of public control of the subdivision of the land should be that of securing an appropriate street and block layout with relation to good city planning and zoning principles. It involves the creation of a good neighborhood environment and its correlation with the planning and zoning of the entire region. Some of the characteristics or essentials of a good neighborhood environment are as follows:

1. The neighborhood must have all the functions and facilities of a complete residence unit. It must have churches, schools, shops, assembly halls, clubs, and small parks or commons.

2. It must have a well-ordered arrangement of these various functions and facilities and a local system of circulation that will not interfere with or be incommoded by the general circulation system of the city or of the region as a whole.

3. The local streets, small parks, building lots, and buildings should in the main conform to the topography. They should be fitted to the contour of the land, and their location and arrangement should seem to be necessary and natural.

4. The residence neighborhood must possess the natural beauty that comes from private gardens, street trees, and small parks; and from the careful preservation in its planning of the scenic beauty and exceptional physical features of its site.

A good neighborhood environment involves opportunities for contact with nature. It involves intimate contact with gardens, trees, natural landscape features, and extended water and sky views. It involves opportunities for walks in quiet places. It involves ample play space for the children, both in private gardens about the homes and in a "common" serving an entire block or subdivision.

One of the prime purposes of platting control should be the conservation of natural beauty of the fullest extent consistent with use for residence purposes. A clump of trees, a wooded ravine, a rocky ledge, a water view—is a community asset of very real value. It should be conserved for the community either on private property through an appropriate public easement or as a small park or common.

Locating the Main Thoroughfares

In determining the general location of main thoroughfares, due consideration should be given not only to traffic requirements but also to the importance of furthering the development of self-contained neighborhood communities. Such neighborhood communities can best be developed when they are given definite physical boundaries. It is difficult to develop such a neighborhood community in an area bisected by a heavy-traffic artery. In a residence area to be developed primarily with single-family detached houses, if main thoroughfares are located at half-mile intervals, the requirements for through traffic will be met. The general pattern thus formed will separate the residence area into 160-acre tracts, each of which will be surrounded by main traffic roads. Each of these 160-acre tracts can be then planned as a complete neighborhood unit with provision for small parks and playgrounds, for a public school and for a neighborhood shopping center. When fully built up, the unit will have a population of 3,000 to 6,000. The resulting elementary school population of 500 to 1,000 can be accommodated at a single school centrally located, and no pupil will have to walk much more than a quarter of a mile to the school.

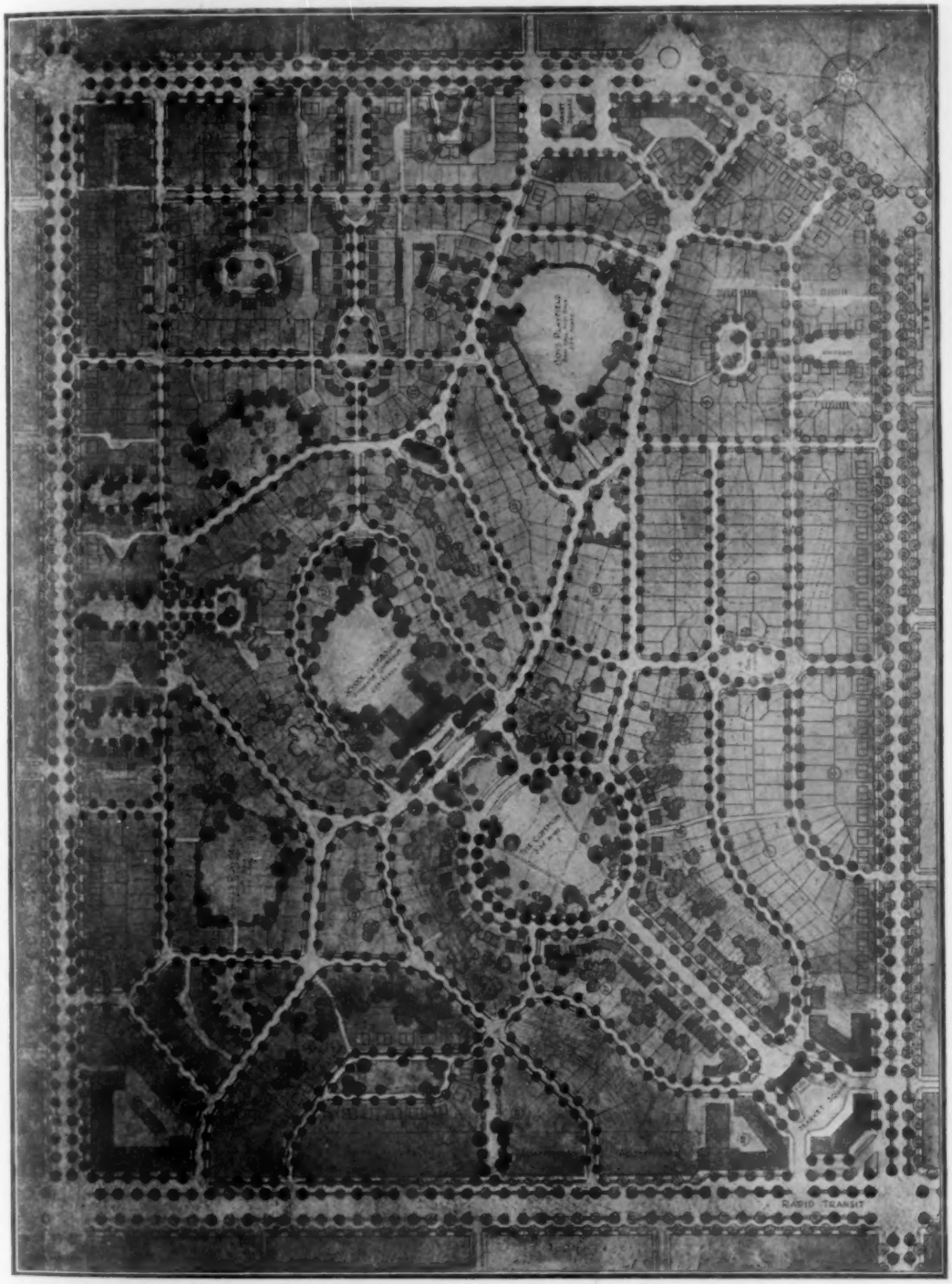
In the comparatively limited zone where apartment house construction may properly be anticipated, the main thoroughfares should be laid out at ¼-mile intervals instead of ½-mile intervals. The resulting 40-acre tracts with the apartment-type of housing will give a population of 5,000 to 10,000. When ripe for possession, these small units, also, can be planned for the functions and facilities of a complete unit.

Power of Condemnation, with Public Control

There are great difficulties to be overcome before the unbuilt fringes around cities can be generally subdivided and developed for real community neighborhoods. The capital required for the complete development of a 160-acre tract is very large, and the period of development during which carrying charges cumulate must necessarily extend over a considerable period. The financial success of various large projects of the kind proves, however, that this is a fundamentally sound basis of city building. These projects, however, have been for high-class residences, and it remains to be demonstrated that the same financial success can be obtained with developments for medium- or low-cost housing.

One handicap to a more general application of this method of creating real neighborhood communities is the difficulty often experienced in buying numerous small tracts of land and combining them into an area large enough to make a self-contained neighborhood. To obviate this difficulty, it will be necessary to give

the development company the power of condemnation. A company organized to build a neighborhood community is performing a most important function in the interest of the city and state. It should have the right of condemnation, just as that right is granted to the railroad or other public utility company. In return for this grant of state authority, the



Robert Whitten, City Planning Consultant; Gordon Culham, Landscape Architect

NEIGHBORHOOD UNIT SUBDIVISION FOR LOW- OR MEDIUM-COST HOUSING

development company should be subjected to a sufficient measure of public control to insure the building of a real neighborhood community with proper provision not only for the necessities but also for the amenities of neighborhood life.

A practical way can doubtless be found to do anything really essential to the development of our urban communities along lines of economy, efficiency, harmony and beauty. This way must conform strictly to the genius of our institutions. It must safeguard all essential private property rights, while at the same time promoting the public welfare. It must yield to the constitutional limitation that private property cannot be taken for a public use without just compensation, while at the same time giving effect to the equally fundamental principle that the use of private property may be subjected to reasonable regulation in the interest of the public health, safety and welfare.

Small Parks and Playgrounds

The setting-aside of small parks and playgrounds need not create a serious economic burden for the housing development. This fact is well stated in the 1925 Report of the New York State Commission of Housing and Regional Planning, at page 58:

> "As was seen in the previous section, raw land cost in undeveloped areas is a minor item of cost. Provided that open spaces do not increase the amount of public utility improvements per family, recreational areas can be increased to an extent heretofore generally believed impossible without substantially raising the cost per family. The simplest method of doing this is to create public parks on the least desirable tracts."

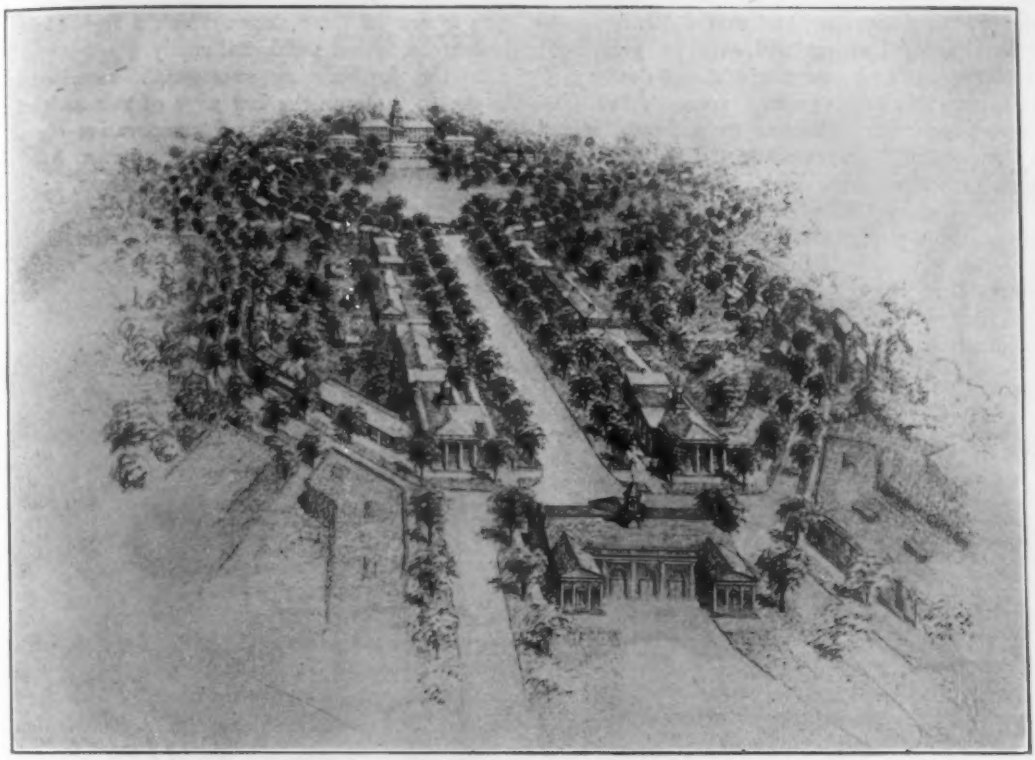
In estimating the cost of setting aside small parks in subdivisions, it is important to bear in mind that not all land is physically suitable for cutting up into streets and lots. It often costs almost as much to prepare a lot for building as the improved lot is worth. On most 100-acre tracts there is a marsh, pond, quarry, gravel or sand pit, stream course, rocky ledge, or steep slope that is expensive to condition for building purposes. Often, too, these areas that are physically unsuitable for building purposes have exceptional value for park purposes. To use them for building results in economic and social loss to the community.

In this connection the experience of the United States Housing Corporation is valuable. The housing projects of the corporation were located in 72 municipalities and included 128 separate sites and a total of 5,033 acres of land. Of this total area, 886 acres or 17.6 per cent was set aside for parks, playgrounds, and other public open spaces; and of this total amount so set aside, 584 acres was land physically unsuited for cutting up into lots and streets. Thus, based on the experience of the Housing Corporation, 11.6 per cent of the gross acreage of the average subdivision is physically unsuitable for cutting up into lots and can be converted into public open spaces with little or no additional cost for the bare land.

Methods of Securing Open Spaces

Where the land making up a logical neighborhood unit tract is divided among a considerable number of small owners, it would of course with present methods of subdivision be difficult to secure the proper layout of small parks and playgrounds by taking the matter up with each subdivider at the time he subdivides his small tract. Many are inclined to the belief that the only way to secure small parks and playgrounds is for the city to take the land by condemnation and assess the cost back on the land that will be benefited by the small parks. This is a method that may have to be resorted to in some cases, but is not deemed practical for general application. For general application, it is almost as impractical as the method sometimes proposed of laying down a complete local street system in advance of subdivision and assessing the cost of the land within the streets upon the property. This method imposes financial burdens on acreage property long in advance of its subdivision for building purposes. It is unpopular and economically unsound.

The best that we have been able to do has been to proceed on a plan of having a tentative layout of streets and of securing a substantial conformity therewith at the time the subdivision plat is approved. This is not always feasible. It might in a particular case impose an undue burden on the small owner to compel the dedication of all the street space required by the plan. Such a situation is met as it arises. Sometimes the damage to the owner is borne by the city. Sometimes it is assessed on the adjacent property that will be benefited and sometimes the plan is so amended that it will not impose an undue burden on the developer. If a tentative plan for neighborhood small parks and playgrounds is laid out in advance, there will be little or no difficulty in securing substantial adherence to the plan, if there are not more than four owners for the entire tract. Where there are a great many small owners, difficulties will multiply and in a few cases it may be necessary for the city to purchase from its general fund the land required for small parks or to create a park



NEIGHBORHOOD UNIT SUBDIVISION, LOOKING FROM MARKET SQUARE TOWARD THE COMMON AND THE SCHOOL

assessment district and assess the cost on the entire neighborhood.

It is sometimes stated that numerous small parks and playgrounds are a liability rather than an asset to a city. The cost of park maintenance per acre will be much less if the area required for a dozen small parks is consolidated in one large park. This is true, but the one large park cannot fulfill the same function as a dozen small neighborhood parks. The neighborhood park, if properly located, is the neighborhood civic center. It brings amenity and a sense of neighborhood pride and unity. It is a real necessity if the neighborhood is to develop a live civic consciousness.

The question is not whether several small parks are more costly to maintain than a single larger one, but whether the small neighborhood park is worth its cost. While it is believed that it is, it is also recognized that special attention should be given in small park design to the securing of greater economy of maintenance.

The efficiency of a system of playgrounds is in direct proportion to their number and distribution. A playground will be used most intensively by those living nearest. This is especially true of playgrounds for small children and of play space where the older boys and men may get in 20 minutes to 30 minutes of exercise at odd times. That is why the street in front of the home is so popular even when a perfectly good playground is available at a distance of but half a mile. The distribution of playgrounds, tennis courts, small parks and greens should be such that there will be very little desire to use the streets for play space.

The Neighborhood Plan

Following the neighborhood unit idea developed by Clarence A. Perry, the neighborhood plan here proposed for a 160-acre tract:

1. Bounds the tract with wide traffic streets and allows no through traffic within the tract.
2. Centers the community life about a centrally located school, auditorium, playground, and common.
3. Locates store centers on or near the bounding streets.
4. Provides adequate small park and playground areas.

The entire design of the neighborhood unit as here worked out is based on permanency. There is no provision for convertibility. It is assumed that each 40-foot lot will be permanently a single-family detached-house location

and that each 60-foot lot will be permanently a double-house location; and that no more intensive type of housing will ever be permitted. The street and pavement widths and design and the park and playground areas have been determined with reference to a fixed density of population. It seems necessary to frankly abandon the problematic advantages of convertibility in order to secure the undoubted and in all probability permanent advantage of an attractive neighborhood community of single-family homes.

Apportionment of 160-acre tract as between dwellings, apartment houses and business:

	Acres	Per Cent
Dwellings	137.8	86.1
Church and school sites	1.6	1.0
Apartments	6.1	3.8
Business	14.5	9.1
Totals	160.0	100.0

Apportionment of 160-acre tract as between building lots, streets and other open space:

	Acres	Per Cent
Building lots	98.0	61.2
Parks, playgrounds, plazas, greens	18.2	11.4
Streets	43.8	27.4
Totals	160.0	100.0

Detailed apportionment of 160-acre tract:

	Sq. Ft.	Acres	Per Cent
Dwelling-house lots	3,765,650	86.5	54.0
Business blocks	284,000	6.5	4.1
Apartment house lots	147,000	3.4	2.1
Parks and playgrounds	600,600	13.8	8.6
Streets	1,911,650	43.8	27.4
Greens and circles	138,000	3.2	2.0
Market squares	50,700	1.2	0.8
School and church sites	72,000	1.6	1.0
Totals	6,969,600	160.0	100.0

Comparison of Neighborhood Plan and Standard Layout

A careful research study has been undertaken to determine the comparative cost of developing a 160-acre tract as a complete neighborhood unit for low- or medium-cost housing, as compared with the more usual subdivision with rectangular street layout and no provision for community features.

For this purpose, an actual tract of land located in the large subdivided area north of Jamaica in the borough of Queens was selected for study. The area selected has an assessed value of $1,500 an acre. On two sides of the tract there are existing country roads that the city has planned as main thoroughfares, and the city plan calls for main traffic boulevards on the two other sides of the tract. The tentative plan of streets adopted by the city for this area is the city's customary layout with blocks 200 feet wide by 600 feet long, and with 60-foot streets on the longer sides of the block and 80-foot streets along the ends of the block. The tract is partly wooded. The subsoil is sand and gravel and the drainage is good. The contours are gently rolling, except in the northern portion where the steep slopes render a rigid grid-iron street layout somewhat costly.

In the forthcoming monograph, mentioned in the footnote on the last page of this article, the results of this study of comparative costs are summarized for bounding streets, local streets, business centers, recreation areas, residence sections, street improvement costs, cost of raw land, and cost of lot with improvements. The concluding paragraphs of the study follow:

Cost of the Lot with Improvements

Summary of street improvement, land, and carrying costs per lot under neighborhood plan and standard layout:

	Neighborhood Plan	Standard Layout
Street improvements	$485.27	$856.75
Raw land	380.00	400.00
Totals	$865.27	$1,256.75
Interest 8 per cent	69.22	100.64
Grand totals	$934.49	$1,357.39

As the average lot width is 37.4 feet, the land and improvement cost is $24.98 per foot front in the neighborhood plan and $36.29 per foot front in the standard layout.

In the above, no allowance has been made for the necessary cost of sale or for a reasonable profit to the developer. In the case of the neighborhood plan, it is believed that the profits from the sale of business lots will much more than take care of a reasonable allowance for cost of sale and profit, and that consequently a 40-foot lot can be sold to a prospective home owner or builder for $1,000.

$1,000 to $1,500 for a house lot is probably about the limit that low- or medium-cost housing will stand. If, therefore, the cost per front foot is more than $25 to $37.50, it will probably be necessary to proportionately reduce the width of the lot below 40 feet to make the investment in the small single-family house economically sound.

Cost of Completed House

The cost of small-house construction in the borough of Queens, New York City, in recent years has been under 30 cents a cubic foot. At 30 cents a cubic foot, a two-story, five-room house can be built for $4,000. To this should be added the cost of grading, seeding, and planting the lot and of laying walks to front and rear doors:

Grading, 55 cubic yds. at $1.00	$55.00
Seeding, 192 sq. yds. at $.25	48.00
Planting	0.00
Walks, 53 sq. ft. at $.30	15.90
Walks, 55 sq. ft. at $.40	22.00
Total	$149.90

The house plus the lot improvements amounts to $4,150. With the lot cost at $1,000, the total

cost of a five-room detached house on a 40-foot lot under the neighborhood plan is $5,150.

Omitting interest and depreciation, the annual carrying charge to the owner of the $5,150 home is as follows:

Taxes at 2.73 per cent on 80 per cent cost	$112.47
Water tax	13.00
Insurance	6.66
Repairs	40.00
Total	$172.13

Assuming that the owner has paid down $650 and has given a first mortgage of $3,100, and a second mortgage of $1,400, the principal of which is to be amortized in 17 years, the annual payments would be as follows:

First mortgage: 6 per cent on $3,100	$186.00
Second mortgage: interest and amortization (17 years)	134.00
Total	$320.00

Interest and amortization, $320, plus taxes, insurance, and repairs, $192, makes a total annual cost of $512. In order to compare this cost with the rental of an apartment where heat would be furnished, it is necessary to add $90 for coal. This brings the total to $602, or a trifle over $50 a month. As it is a five-room house, the monthly cost corresponds to a tenement rental charge of $10 per room.

The single-family house in the neighborhood plan, while not within the means of the poorest families, would be within the means of the very large number of families having an income of from $1,800 to $2,500 a year. The thousands of small houses on narrow lots that have been sold in the borough of Queens during the last five years at from $4,800 to $7,500, shows the demand for small single-family houses. These houses, some of flimsy construction, and all built in monotonous rows on narrow lots, with most street improvements lacking and with no provision for community life or for parks and playgrounds, are but a sorry makeshift as a solution of the housing problem.

Better Housing without Increased Cost

It is believed that the plan outlined shows a way in which a better type of housing without increased cost can be secured for the large number of families of limited income that in most cities are being housed under conditions similar to those above referred to as existing in the borough of Queens.

The new state housing legislation of New York State, providing for the formation of limited dividend housing corporations, furnishes an agency through which a practical demonstration of the economic and social advantages of the neighborhood plan for low- or medium-cost housing might well be made. In this way it is believed that the building of complete neighborhoods would be shown to be sufficiently profitable to induce the formation of large corporations operating for profit, that would in the future supply the demand for medium-cost housing in complete neighborhood units. The large scale operations of such corporations would make possible lower construction and financing costs and they would have the advantage, also, of a large source of profit in the business frontage values created by the complete neighborhood development.

The neighborhood plan is one that can be adapted to all grades of housing. It is as well adapted to high-cost homes as to low-cost. The comparison here worked out on the basis of the small five-room detached house on a 40-foot lot could be repeated on the basis of more expensive houses on 50-foot lots or of four-room houses on 30-foot lots. Nor is it to be assumed that any neighborhood unit would consist of a single type of house. In the neighborhood plan here outlined, while two-thirds of the families are housed in single-family detached houses, 19 per cent are in double houses, 3 per cent in row houses, and 12 per cent in apartment houses. These proportions should be varied where land costs are different or the income status of the occupants is different from that here assumed. Moreover, while the five-room house is taken for the purposes of the cost estimate, it is probable that there would be a considerable number of four-room and six-room houses in the development.

If the problem were that of providing houses for families with incomes under $1,800 a year, a neighborhood unit might be worked out on the basis of four-room houses on 30-foot lots, and with a much larger proportion of double houses and of row or group houses. Such a development could more properly be considered as a substitute for the tenement in the housing of the poorest families, than could the development here considered, which aims to meet the needs of the $1,800 to $2,500 income families.

AUTHOR'S NOTE.—The research on which this article is based was made possible by financial support from research funds of the School of Citizenship and Public Affairs of Syracuse University, and by the cooperation of the Regional Plan of New York and Its Environs. Several members of the Regional Plan staff have made valuable contributions to the work. As landscape architect, Gordon Culham designed the neighborhood subdivision. H. H. Hemmings supplied the engineering data and cost estimates. Thomas Adams, Director of the Regional Plan, has given most valuable criticism and advice. Much of the work is based, moreover, on a monograph by Clarence A. Perry of the Recreation Division of the Regional Plan, setting forth the neighborhood unit as the ideal in land development. I wish specially to acknowledge the helpful cooperation at all stages of the work of Dr. William E. Mosher, Managing Director of the School of Citizenship and Public Affairs.

The complete monograph, which goes into much greater detail than the space limits of this article permit, is printed as the first of the new series of Bulletins issued by the School of Citizenship and Public Affairs and is obtainable on application to Dr. Mosher, at Syracuse, N. Y.

Cost Accounting for Pipe-Laying Jobs

By Homer V. Knouse

Construction Engineer, Metropolitan Utilities District, Omaha, Nebr.

COST accounting as an element of utility operation or construction is of universal appeal. The size of the property or the extent of the operation does not greatly affect the interest, for in any case the balance sheet is the principal index of the success of the enterprise. The operator of a small property must conserve his resources and scrutinize his expenditures quite as carefully as the department head or executive of a plant supplying many thousands. Failure to carefully watch all

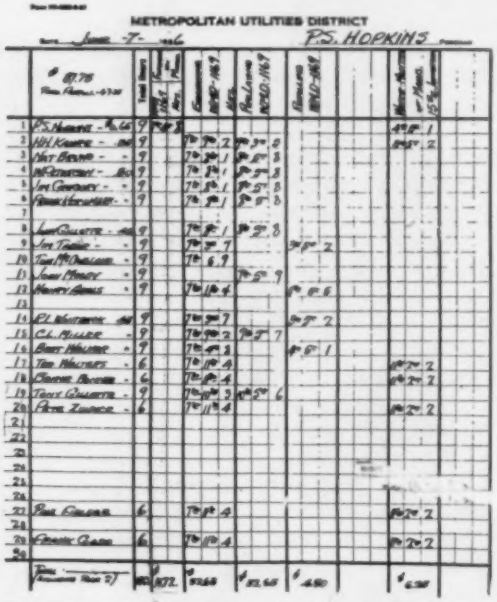


FIGURE 1.—DAILY TIME REPORT OF FOREMAN

expenditures, and neglect in the study of costs in terms of units of output or construction, will ultimately result in embarrassment, or in many cases failure.

Cost accounting may have several objectives, and each will require a somewhat different treatment. If it is for the purpose only of maintaining a perpetual inventory of the plant, much less detail will be necessary than if it is for the guidance of the estimating department. The power-plant operator will care less about the total tons of coal burned than the coal cost per thousand gallons of

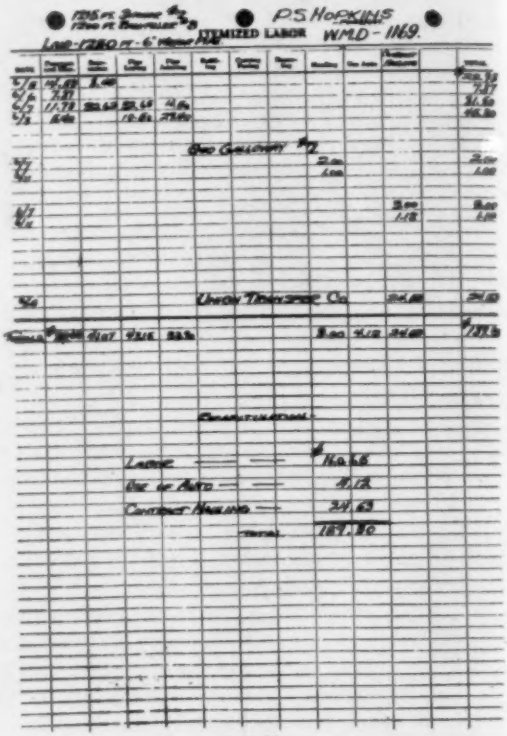


FIGURE 2.—RECAPITULATION SHEET FOR DAILY POSTING OF ITEMIZED LABOR AND INCIDENTAL ITEMS OF COST

water pumped, or the kilowatt-hours of power delivered to the buss bars. The ideal system is one, of course, that will entail the minimum amount of labor in its development and use, and that will contain elements from which each

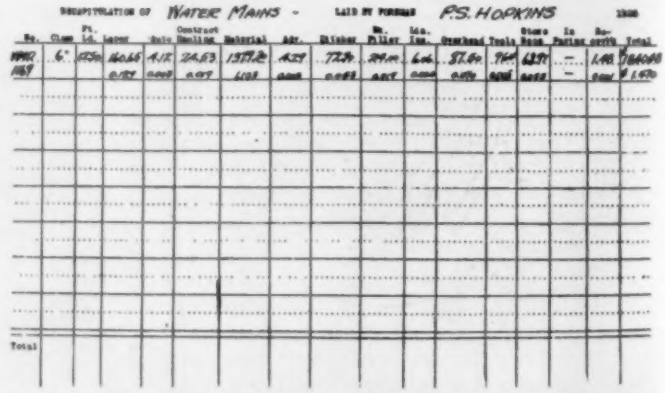
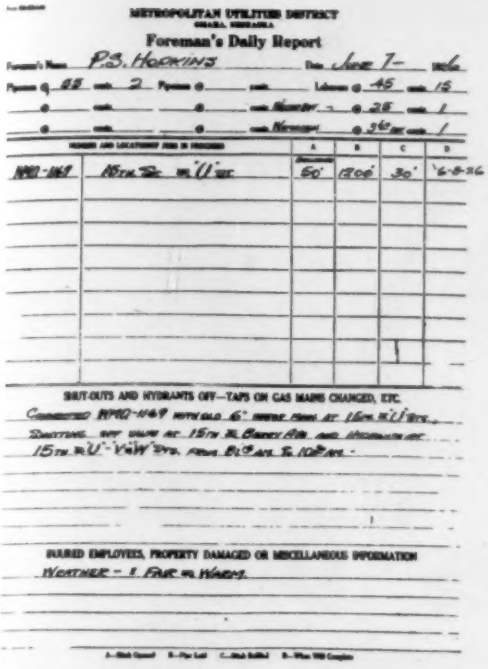


FIGURE 3.—RECAPITULATION OF COSTS OF JOBS CONSTRUCTED BY EACH FOREMAN

Upper line is totals, lower line costs per foot



METROPOLITAN UTILITIES DISTRICT
OMAHA, NEBRASKA

Foreman's Daily Report

Foreman's Name P.S. Hopkins Date June 7- 1926

Pipemen @ 22 rate 2 Pipemen @ rate Laborers @ 45 rate 15
@ rate @ rate Operator - @ 28 rate 1
@ rate @ rate Helper @ 36 rate 1

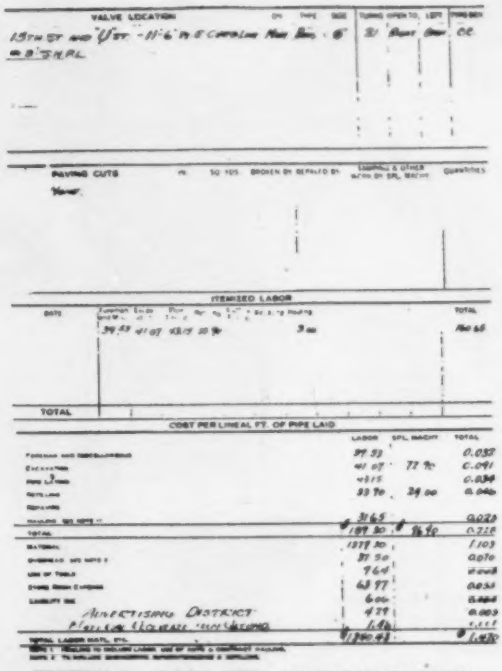
Number and Location of Job Progressed	A	B	C	D
WRD-1169 15th St. to U St.	60'	1106'	30'	6-8-26

SHUT-OUTS AND HYDRANTS OFF—TAPS ON GAS MAINS CHANGED, ETC.
Connected WRD-1169 with old 6" water main at 15th & U Sts.
Shutting off valve at 15th & Church Alley and Hydrant at
15th & U - View Pl. from B St. to 10th Ave.

INJURED EMPLOYEES, PROPERTY DAMAGED OR MISCELLANEOUS INFORMATION
Weather - 1 Fair 0 Windy.

A - Shut Opened B - Pipe Laid C - Shut Refilled D - Water Will Complete

FIGURE 4.—FOREMAN'S DAILY PROGRESS REPORT



VALVE LOCATION

15th St and U St. - 11'-6" N.E. Corner Main Line - 6" - 2 - Bury - Open - CC
on 8" S.W.P.L.

PAVING CUTS

ITEMIZED LABOR

TOTAL

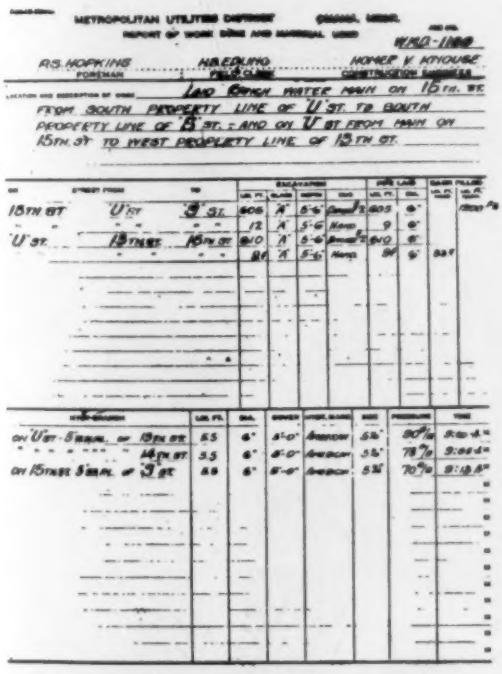
COST PER LINEAL FT. OF PIPE LAID

	Labor	Spl. Mach't	Total
	39.53		0.057
	41.07	72 %	0.041
	41.15		0.038
	33.70	24.00	0.046
	$165		0.028
	189.30	$ 8.40	0.218
	1878.30		1.103
	37.50		0.070
	7.64		0.008
	63.77		0.051
	6.00		0.006
	4.29		0.003
	1.41		0.001
	$1390.43		$ 1.410

Advertising District
Pelican Hotel Building

FIGURE 6.—PAGE TWO OF FINAL REPORT

class may obtain the information they desire. Much time and study have been given to the subject by executives and accountants, and in the larger plants the entire time of departments of considerable size is required to collect necessary information and put it in shape to be of use by each of the interested persons in the organization.



METROPOLITAN UTILITIES DISTRICT OMAHA, NEBR.
REPORT OF WORK DONE AND MATERIAL USED WRD-1168

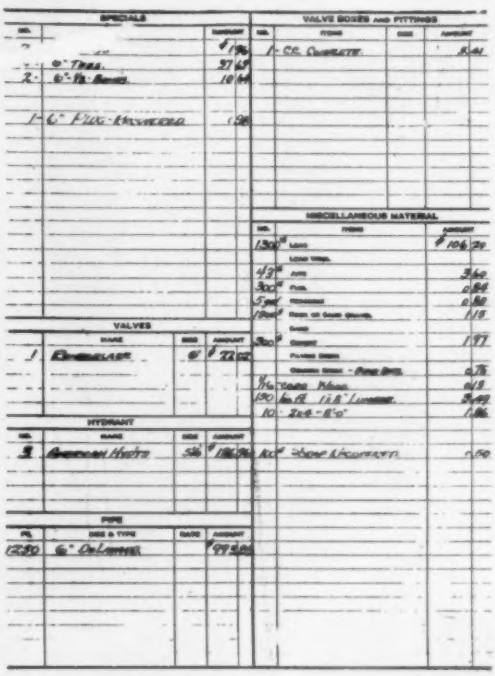
R.S. Hopkins Foreman — H.B. Edlund Field Clerk — Homer V. Kinouse Construction Engineer

Location and description of work: Laid 6inch water main on 15th St.
from South property line of U St. to South
property line of B St. and on U St. from main on
15th St. to West property line of 13th St.

Street From	To	Excavation No. Ft.	Class	Width	Depth	Gate Line No. Ft.	Dia.	Gate Pulled No.	Dia.
15th St	U St.	3 St. 605	A	5'-6"	Ground	605	6"		
" "	" "	12	A	5'-6"	Rock	9	6"		
U St.	13th St.	15th St. 610	A	5'-6"	Ground	610	6"		
" "	" "	20	A	5'-6"	Rock	20	6"	2	6"

	No. Ft.	Dia.	Depth	Hydrant Name	Gate	Pressure	Time
On U St. - S. Side of 13th St.	55	6"	5'-0"	American	5½"	90 lbs.	9:00 A.M.
" " " " 14th St.	55	6"	5'-0"	American	5½"	78 lbs.	9:00 A.M.
On 15th St. S. Side of 3 St.	55	6"	5'-0"	American	5½"	70 lbs.	9:10 A.M.

FIGURE 5.—PAGE ONE OF SIX-PAGE FOLDER WHICH COMPRISES FINAL, COMPLETE REPORT OF JOB



SPECIALS

No.	Items	Amount
1	6" Tees	$ 1.96
2	6" Ells - Bends	37.65
1	6" Plug - Threaded	10.44

VALVE BOXES AND FITTINGS

No.	Items	Size	Amount
1	C.C. Complete		$ 8.41

MISCELLANEOUS MATERIAL

No.	Items	Amount
130 lbs.	Lead	$ 10.29
45 lbs.	Jute	3.60
300 lbs.	Pitch	0.84
5 gal.	Primer	0.80
10 gal.	Paint - Coal Tar Varnish	1.10
300 lbs.	Cement	1.77
	Paving Brick - Pipe Brick	0.75
1/4 cu. yds.	Trap Rock	4.13
150 lin. ft.	12 ft. Lumber	3.99
10	2x6 - 16'-0"	1.86

VALVES

No.	Name	Size	Amount
1	Chamberlain	6"	$ 7.72

HYDRANT

No.	Name	Size	Amount
1	American Hydro	5½"	$ 18.72

Paint - Hose Mountain 1.50

PIPE

Pcs.	Size & Type	Gate	Amount
1250	6" Cl. Lined		$ 99.20

FIGURE 7.—PAGE THREE OF FINAL REPORT

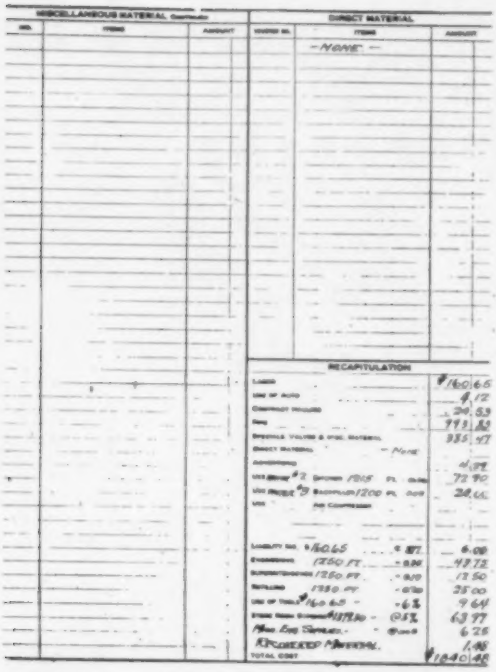


FIGURE 8.—PAGE FOUR OF FINAL REPORT

The plan described herein, while it contains all the elements that could be desired by any department, whether it be the accounting, the engineering, or the operating department, has been developed to serve, in addition to the foregoing, a part of the organization which is not generally considered when systems are developed, namely, the gang foreman. The foreman should be given consideration, for the economical handling of construction work rests largely on his shoulders. By placing in his hands such data as will enable him to analyze his methods of doing work, it is inevitable that greater efficiency will result. The foreman is thus raised from the status of "herder" of common labor to that of a man who has responsible charge of a small business, and the proper type of foreman is bound to respond to this responsibility and increase his own efficiency as well as build up a better gang of men under him.

This paper will describe the plan used to obtain costs of laying water and gas pipe, and variations will suggest themselves to adapt it to other classes of work or to particular local conditions. Special attention has been given to the element of time, so that as complete data as possible are available to the foreman within a day or two after the completion of the job, in order that he may have all the circumstances fresh in his mind when checking his costs.

Data for labor costs are reported by the foreman on his daily time sheet to the timekeeper. Labor is subdivided as follows:

Foreman and miscellaneous
Excavating
Pipe laying, including jointing
Refilling, including flushing or tamping
Cutting paving
Repaving

From these data the timekeeper's department posts totals to a labor recap sheet daily, and immediately upon the completion of the job the totals and unit costs are figured and a summary forwarded to the foreman. No attempt is made on this preliminary report to include material costs, since the compilation of material costs requires more time, and the amount of material used is largely out of the foreman's hands.

All material is delivered by the storekeeper on orders of the foreman, and the quantities drawn are checked against the quantities as used in the job. A field clerk makes a report of all material used, as well as data as to the location of the completed line, location of valves, hydrants, special castings, and structures of other utilities which are encountered during the progress of the work. Notes are made as to the size of paving cuts, character of the weather, and any other element that would affect the cost of the work. The completed report is a complete record of the job, and is used by all departments for their particular records. The Accounting Department is interested in the total cost to the plant values, and notes the additional hydrants that are to be billed to the city; the Engineering Department posts the data on the necessary maps; the Tax Department uses the data for extending the assessments against abutting property. Data as

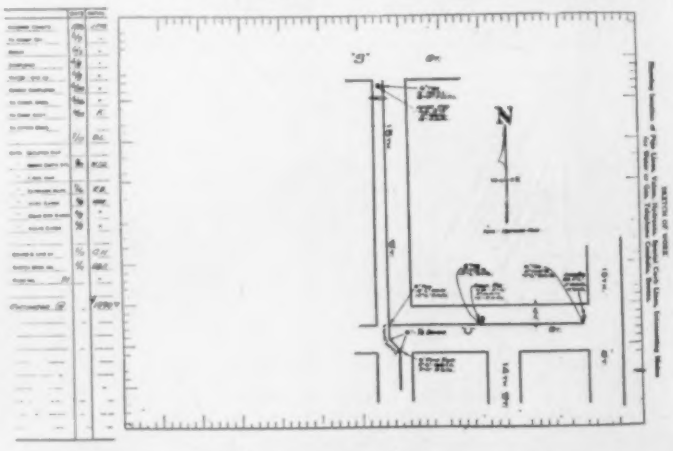


FIGURE 9.—PAGES FIVE AND SIX OF FINAL REPORT

to hydrant pressures, dead ends, etc., are posted on the proper records, and the report is finally filed as a permanent record. A summary of the total cost is then forwarded to the foreman who had charge of the work, for his information and guidance.

Marked increase in efficiency and decrease in unit costs have been noted since this method of aiding the foreman has been in effect. There is a friendly rivalry between gangs to get low costs and large footage of pipe laid, and any element out of their own control which affects costs is quickly brought to the attention of the general foreman for adjustment. As an example of this kind, a foreman reported that he could not keep down his costs of refilling ditch because of the large amount of trimming or cleaning-up when a particular backfiller was used on the job. A study of the operation of this backfiller disclosed that it was making about 40 per cent more footage than another similar machine, but that this gain was in fact at the expense of careful cleaning-up. The unit costs of this machine were, of course, less than those of other machines, but when the cost of additional labor was added to the machine cost it was clearly demonstrated that the operator on the "slow" machine was the more efficient.

Carelessness in the handling of material by truck drivers which caused breakage, resulted in an increased labor cost on the job, and reports were soon available from the foreman which located the trouble. Defective castings and poor quality of any material are more carefully checked in order that there may be no additional or unnecessary labor to complete the job.

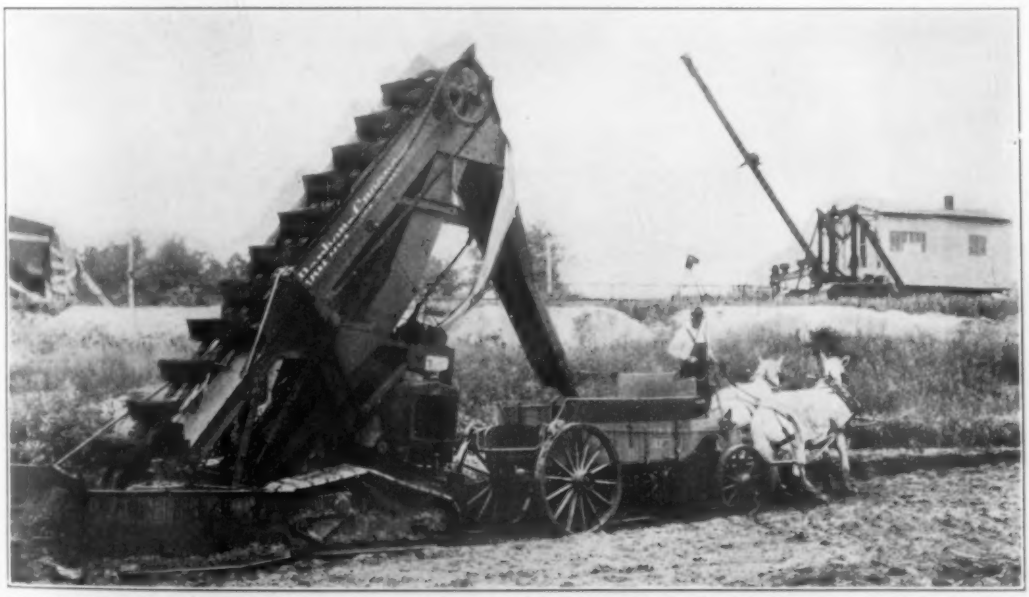
ACKNOWLEDGMENT.—From a paper read before the Iowa Section, American Water Works Association.

Disposal of Sewage Sludge in the City of Worcester

By Andrew G. Holmstrom
Superintendent, Sewer Department, Worcester, Mass.

THE most difficult and costly part of sewage treatment, especially in a large plant like that of Worcester, is the disposal of sludge. Of the $60,000 appropriated for the operation of this plant, approximately $14,000 will be expended on sludge disposal alone, even after the adoption of the Barber-Greene bucket loader. If the work were done by hand, the cost would be about $30,000.

The loader for sludge removal and loading is equipped with 14-inch crawlers instead of the 9-inch crawlers usually provided, to pre-



BARBER-GREENE LOADER REMOVING WINDROW OF DRIED SLUDGE FROM SAND-BED AT WORCESTER, MASS., SEWAGE TREATMENT WORKS

vent the machine from sinking into the sand. It might be of interest to know that the load is 6.9 pounds per square inch. Special plows have been built on each side of the revolving discs, as on the Barber-Greene snow loader. The chute is covered to prevent dust from flying. No other changes have been made in the standard machine.

The sludge from the Imhoff tanks is drawn off upon drying beds to a depth of 6 to 12 inches. These beds, twenty-three in number, are square and one acre in area, and were formerly used for the intermittent filtration of sewage. This area is greater than necessary. The thickness of sand is 54 inches and would have been less if new beds had been built.

The wet sludge contains from 94 to 96 per cent water. It takes from three to four weeks to dry, varying with the weather conditions. When dry, the sludge contains from 20 to 60 per cent water.

Before loading commences, the dried sludge is scraped into windrows 6 feet in width. This part of the work is done very quickly and saves the loader many trips across the beds and also makes the work of loading faster and easier. The loader can load directly from the bed without windrowing and do it as effectively. It is more economical, however, to follow the first procedure. It takes two and one-half to four hours to windrow one bed with a two-horse road scraper, and three to four days to clean one bed.

The loader discharges into horse-drawn 2-yard Watson wagons. The dried sludge is carted to dumps located alongside the drying area, to which the average haul is 600 feet. Horse-drawn wagons have been found more economical than trucks, as the haul is very short. To keep the loader moving constantly would require practically as many trucks as wagons, which would mean a large initial expenditure, to say nothing of the additional expense of maintaining the service.

The cost of loading by hand and hauling to the dump varied from 90 cents to $1 per cubic yard, the average haul being 350 feet. The loader has reduced this cost to 29 to 42 cents per cubic yard, depending on the length of haul.

The organization used with the loader consists of one foreman, one operator, two men at the loader, two men on the dump, and three to five wagons.

The machine has been in operation for six months. During that time there have been no repairs. It uses 10 gallons of gasoline a day. The oil is changed weekly and there is no need for additional oil during the week. The cost of operating the machine is about 2 cents per cubic yard of sludge removed.

Although this plant has produced 14,000 cubic yards of dried sludge since May 10, when the machine was put in operation, the loader needed only to be operated 89 days out of 174 days to keep the beds clean. The machine is always ready to go into a bed the moment the bed is dry; there has never been a delay. This factor is extremely important in a plant where they have not had the good fortune of inheriting so many acres of filter bed.

This method of sludge removal is a success. We even hope to reduce the cost still more as we become more familiar with the machine, and perfect the detail of this method of sludge removal and disposal.

Vacant Lots

By Molly Anderson Haley

(A poem which might have been dedicated to the speculative builder and the unimaginative subdivider.—Reprinted by permission from The Forum)

THE city charts, white-veined on crackling blue,
Named it a "vacant lot,"—that was not true
Whatever else they said. For who could pass
Such gracious trees, or touch cool-fingered grass,
Breathe in the pulsing fragrance of it all
From tiptoeing Spring on through the flaming Fall,
Feel wings stir arching branches overhead
And still deny the place was tenanted?

Hoarse-voiced the builders came, with jangling chains,
Trees crashed to earth, dark sweating men dug drains,
Stripped sod, gouged pits, poured clattering streams of bricks,

Set up in naked rows their ugly sticks,
Made boxes to imprison beds and chairs
And phonographs and arguments and cares:
Now, whether they admit the truth or not
On those blue charts, it is a vacant lot.

Details Essential in the Construction of Hot Mix Pavement

By Francis P. Smith

Dow & Smith, Consulting Engineers, New York

SOME of the qualities of a hot mix pavement are inherent in the mixture itself and are therefore fundamentally questions of design. Other qualities involve design, manufacture and laying methods while still others are functions of the last two only.

Necessary Qualities and How to Secure Them

The effective life of a hot mix pavement is largely dependent upon the quality of the mixture, the uniformity of the pavement as to composition, thickness and density, and the contour of the finished pavement. Of equal, if not greater, importance are the kind and character of the foundation, subsoil, and drainage.

In the earlier days much less attention was paid to these details than is now necessary. The factor of safety was much greater because much less was required of the pavement, and this inevitably led to more or less careless work, and the acquired habit is hard to shake off. Old-time superintendents and foremen are inclined to jeer at extreme precautions and to class them as "old fogeyisms," utterly failing to realize that they themselves are the "old fogeys."

The strain of modern traffic is so terrific that it calls for the exercise of the most skillful workmanship to enable even the best of materials to withstand it, and this is true of every type of modern pavement. In most instances it costs no more to lay a pavement in accordance with the best modern methods, than it does to lay it carelessly. The importance of these factors from the standpoint of competitive design and maintained costs cannot be too strongly stressed.

Quality of the Mixture

The quality of the mixture is dependent upon its design, the character and uniformity of the materials entering into its composition, and the methods of manufacture employed. Eternal vigilance is necessary to insure uniformity and quality of deliveries of raw material to the plant. The chief variation is found in sand and stone deliveries. If these vary to any great extent, it is impossible to make a uniform mixture of them. The product of stone quarries and sand-pits is far from uniform. Major variations in mesh composition, even if within specification limits, call for variations in bitumen and dust content of the mixture. If the formula remains unchanged, the mixture will vary markedly in physical characteristics, and uniformity will be lost even if quality is not impaired. Dirty stone or sand after passing through the dryer frequently has fine dust partly baked on the outer surfaces of the larger grains or particles. This seriously interferes with the proper and permanent adherence of the bitumen coating, and materials of this type should be rejected.

Adequate temperature control is essential to prevent injury to the bituminous binding material. This applies not only to the heating of the bituminous material, but also to the heating of the mineral aggregate. Stone or sand which is too hot will damage the bitumen more seriously in a short time than hours of moderate overheating in a large kettle. In order to

Fifty Years of Hot Mix Pavement Construction

The art of laying hot mix pavements has been developed in this country during the last fifty years. Like most arts with a life history of similar length, it has made great strides, has been confronted with changing conditions and has been hampered with bad habits and traditions acquired during the early period of its existence.

For the first forty years it had to meet the problem of producing a pavement whch would successfully carry a slow-moving, iron-tired traffic of light to moderate intensity. During the last ten years, the density and speed of highway traffic has increased beyond the wildest dreams of human imagination a decade ago and iron tires have been almost entirely replaced by tires made of rubber. This change in the character of the traffic carried by our roads and streets calls for a pavement presenting the same general characteristics as those of the earlier type, but with a marked change in their relative value and importance. Methods of manufacture have been changed and improved and the daily output of single plants has been greatly increased.

secure proper bond between the bitumen and the aggregate, all moisture must be driven out of the aggregate and it must be heated to the correct temperature to facilitate mixing and insure delivery on the work at such a heat as will be most favorable to laying and compression. Too low a temperature increases the difficulty of properly and uniformly coating the mineral aggregate with bitumen and makes a mixture which is difficult to rake on the street and impossible to compress effectively. Varying percentages of moisture in the aggregate call for variations in drum temperature which must be carefully watched. Electrical pyrometers, if properly used, not only indicate temperatures, but are a great aid to the fireman and result in increased output as well as necessary uniformity of mixture. Notwithstanding this, their installation has been bitterly opposed by foremen for the reason that they would seriously curtail the plant output. The logical deduction to be drawn from such an argument is too obvious to require further comment. Undoubtedly, the future will see the widespread development of automatic thermostatic control.

Mixer teeth in good condition, shafts operating at proper speeds, and sufficient time given to mixing, are extremely important. The mineral aggregate must be evenly, uniformly, and completely coated with bitumen. Too often mixer teeth that are half worn down are kept in service and the time of mixing reduced to increase the output. This results in a mixture in which some of the particles are imperfectly coated with bitumen and some parts of the mixture are excessively rich at the expense of other portions which are too lean. Such a mixture is especially liable to wave under heavy traffic.

Thorough adherence of the bitumen to the mineral aggregate is greatly increased by the sustained attrition of the particles for an appreciable period of time. The principle is the same as that involved in thoroughly brushing out the coat of paint applied to a surface for protecting purposes. It is absolutely essential that the film of bitumen should be strongly adherent to enable it to successfully resist water action, weathering, and the movement of the particles of the mineral aggregate under traffic stresses.

Uniformity Retards Wave Formation

Uniformity is perhaps a greater aid toward retarding wave formation than is generally recognized. A pavement in which soft rich spots occur surrounded by a notably harder mixture is much more liable to form objectionable waves and lumps than one which is uniformly soft. In the latter case the displacement will be less localized, that is, will be distributed over a larger area and will have a tendency under certain conditions to heal under traffic, which will be noticeably absent in the former case.

Uniformity of composition is largely a matter of plant control. It is dependent upon uniformity of raw materials, chiefly mineral aggregate, accurate weighing, and thorough mixing. If any of these are slighted, a non-uniform pavement will result. Another source of danger is segregation during transit between plant and street. The coarser aggregates are particularly liable to this, more especially if they are poorly graded and lacking in intermediate sizes of stone, particularly ¼- and ½-inch particles. Most specifications are very lax or indefinite in their requirements as to the amount of ¼-inch material which the mixture should contain. When mechanical spreading is employed, it is difficult to correct segregation. With hand spreading, it is possible to correct it by turning the mixture over with shovels before putting it in place, and this should always be done in the case of coarse aggregate wearing surface. It is perhaps unnecessary with binder, except in extreme cases. The appearance of the average binder course after laying, especially where intermediate-size stone is absent, plainly shows the extent to which segregation takes place in coarse aggregate during transit.

Uniform Thickness Essential

Uniformity of thickness is chiefly dependent upon the grade of the finished base and the care exercised in raking. It used to be almost an axiom in the bituminous paving industry that any errors in the grade of the base would be remedied by the binder and these in turn by the top, as it was desirable to have the surface of the concrete or other base rough in order to prevent the bituminous mixture from sliding on the base. This precluded the possibility of laying it accurately to grade. The fallacy led to a widespread disregard of the contour and grade of the finished base, which is all too prevalent at the present time. It would appear to be axiomatic that a bituminous wearing surface of greatly varying depth is more liable to displacement under heavy traffic than one of uniform thickness, and yet it is very difficult to convince engineers of the necessity of fine grading of concrete foundations. I have at times felt like advocating the use of a template or paving gage on both the foundation and the finished surface. Roughness of surface should be made subordinate to maintaining grade and can be obtained by the use of corrugated rollers, vibrating mats, or similar devices.

Raking

The raking of the hot mixture is usually done by eye. Here a gage would be an improvement. It take many months to make a good raker out of a man who is fitted for the work, and many men never become good rakers. In former days when the plant output was less than at present and horse-drawn wagons delivered the hot mixture on the street, there was sufficient interval between the loads for the head raker to go over the work of the other rakers and correct their errors. Today this is rarely done. There is no time available, and in my judgment there are fewer good rakers, or possibly the demand for them has increased, which amounts to the same thing as far as any one job is concerned. The use of a long-handled screed 4 to 5 feet in length operated at right angles to the direction of raking after the raking is completed, will correct many of the errors of poor raking. Careless methods of spreading or too small a street gang to handle the plant output frequently necessitates standing in the hot mixture. This inevitably causes variations in thickness unless the mixture where trampled upon is "fluffed" up to the same density as the rest of the mixture by the rakers. With a stiff mixture this is hard work, and rakers will not do it conscientiously and thoroughly all day. With the plant pushing the street gang to the limit of its capacity to do good work, this will inevitably happen. The remedy is to increase the street gang, but with a narrow roadway this cannot be done beyond a certain point.

Rolling the Pavement

The density of a pavement is dependent upon its design and the amount of compression it receives. In order to secure maximum stability, it is essential that rolling should be applied and continued in such a manner as to produce as nearly uniform compaction as possible. Here, again, tradition hampers, for in former times areas which were not fully compressed when the pavement was laid received their final compaction under traffic, and in most cases no great harm resulted. The danger of such a practice is increased a hundredfold today. Inadequate roller equipment is all too common, and the fault is partly due to lack of realization of what is necessary to properly handle the large output of modern plants. Increasing the speed of the rollers decreases their compressive effectiveness and tends toward faulty contour. More rollers are required and must be used, and they must be kept continually in operation. The delays incident to cleaning fires and filling up boilers with water have led many contractors and county organizations to turn to the motor roller. The clutch mechanism of this type of roller has recently been greatly improved, but it is absolutely necessary to maintain it in perfect condition. Otherwise the jerks incidental to starting and reversing will be fatal to good contour.

Dense modern mixtures require the use of a heavy roller for initial rolling. After mixes become slightly chilled, it is impossible to effectively compress them. Twelve- and fifteen-ton three-wheel rollers are being increasingly used for this purpose instead of the former five- to eight-ton tandem rollers. They should be put in use just as soon as the raked mixture will take them, and no delays should be tolerated. This precaution is especially essential in cool weather.

Effective raking is a necessary adjunct to effective compression, and a close inspection of the surface after the first rolling clearly shows this. If the raking is poor, the surface of the freshly rolled mixture will show a number of honeycombed spots. These are due to the fact that the full weight of the roller has not been applied to them because it has been chiefly supported by adjacent humps. These humps must be displaced before the low spots can receive proper compression, and that means that more rolling is necessary, and if the humps are large or the street is too narrow to permit diagonal rolling, it is questionable whether a uniform density will ever be obtained through rolling.

When the paving is subjected to traffic, these partially compressed areas may under favorable conditions receive final compaction. If they do not, they will probably ravel out sooner or later, leaving a hole. If they do, a slight depression will be formed which under heavy traffic and unfavorable conditions will diminish the effective life of the pavement and increase its tendency to wave. Uniform density of the finished pavement calls for good workmanship at every stage, and slackness or inefficiency in any one operation can be remedied, if at all, only by increased labor and expense in the subsequent stages. Under former conditions, extreme smoothness of contour was not essential. If there were no low spots which would hold water, it was considered satisfactory, and no discomfort was experienced in driving over it at the maximum speed prevalent at that time. Unevenness of contour to modern high-speed traffic means discomfort and, if extreme, danger and greatly diminished life. A comparatively small depression starts up spring vibration and enormously increases the force of impact which is so destructive to all our modern highways. It also localizes the impact in progressively increasing it to a point where no type of construction will withstand it.

Once more eternal vigilance is the price of uniformity of contour. A straight edge should be continuously used to check up the contour after the first rolling, at which time serious defects are most easily and cheaply remedied. The screed previously mentioned, if properly used, acts as a short, preliminary straight edge which is easily and quickly applicable to any doubtful spot at the time when the defect can be remedied with maximum ease and effectiveness.

The careful leveling of joints must be given close attention if uniformity of contour is to be maintained, but this is secondary in importance to good workmanship in raking and rolling, for the reason that the joints occur only infrequently.

Summary

In conclusion, I would urge particular recognition of the following facts and cardinal principles:

1. That in all types of highway construction, whether of portland cement or bituminous concrete, the factor of safety and the inherent qualities of the mixtures used are such as to imperatively require the best grade of honest and efficient workmanship.

2. Foundations must be adequate, and no foundation can be commercially adequate without proper provisions for drainage.

3. The slighting of any of the stages of construction work with the idea of remedying it later on is expensive and inadequate and cannot produce a satisfactory result. This applies especially to the strict adherence to established grades for the various portions of the pavements.

4. Apart from design, uniformity of the mixture, density, and contour are the three most essential points.

5. Plant: Test all materials delivered, control temperatures and mixing periods, accurately proportion ingredients, and bend every effort toward sending out uniform mixtures.

6. Street: Insist on proper spreading, raking and rolling, and adequate equipment and number of men. Require strict adherence to established grades for the various courses of the pavement, with special attention to the final surface.

ACKNOWLEDGMENT.—From a paper read before the Fifth Annual Asphalt Paving Conference, Washington, D. C.

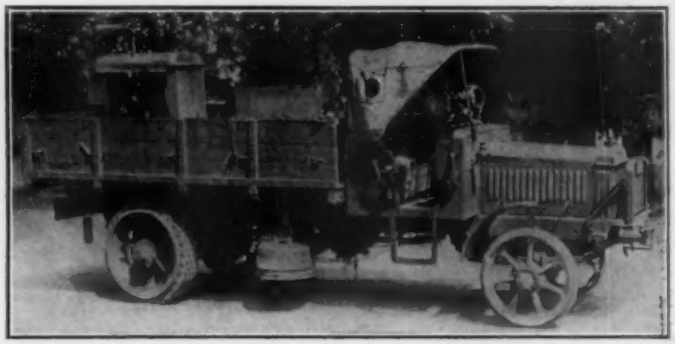
Magnets Clear Roads of Nails

PROFITING by the success of other states in cleaning their roads of nails, tacks, and bits of iron and steel, the maintenance engineer of the Nevada State Highway Department set out to rid Nevada roads of these hazards to safe and happy automobile driving. Two 22-inch lifting magnets made by the Electric Controller & Manufacturing Company, Cleveland, Ohio, were suspended between the front and rear wheels of the 5-ton truck with their faces raised 5 inches above the surface of the roadway. Magnetizing current was supplied to the magnets by a 5-kilowatt direct-current generator driven by a gasoline engine, the engine and generator being mounted as a unit in the truck.

This outfit was first given a tryout over an old railway grade which is being used temporarily as a highway between Reno and Lovelock. Maintenance operations on this grade had caused the track spikes to come to the surface, thereby continually causing punctures and ruining automobile tires.

In one round-trip on this hundred-mile section, 1,370 pounds of nails, spikes, and scrap iron were picked up. An examination and count of this scrap material disclosed the startling fact that on this section there had been a per-mile average of forty-five pieces of sharp-pointed material on the surface of the roadway just waiting the opportunity to puncture and possibly ruin the tires of unsuspecting motorists.

After such remarkable success on the Reno-Lovelock Road, the magnets were used to clean the streets in Carson City. Over 4,850 pounds of nails and other puncture-causing materials were picked up in two days. They are now planning to keep this magnetic road sweeper in continual operation until all the state highways and unimproved city streets on these routes are swept free of these grief-causing hazards.



TRUCK EQUIPPED WITH EC&M MAGNETS SUSPENDED UNDER BODY, WITH ELECTRIC CURRENT SUPPLIED FROM ENGINE MOUNTED IN TRUCK BODY

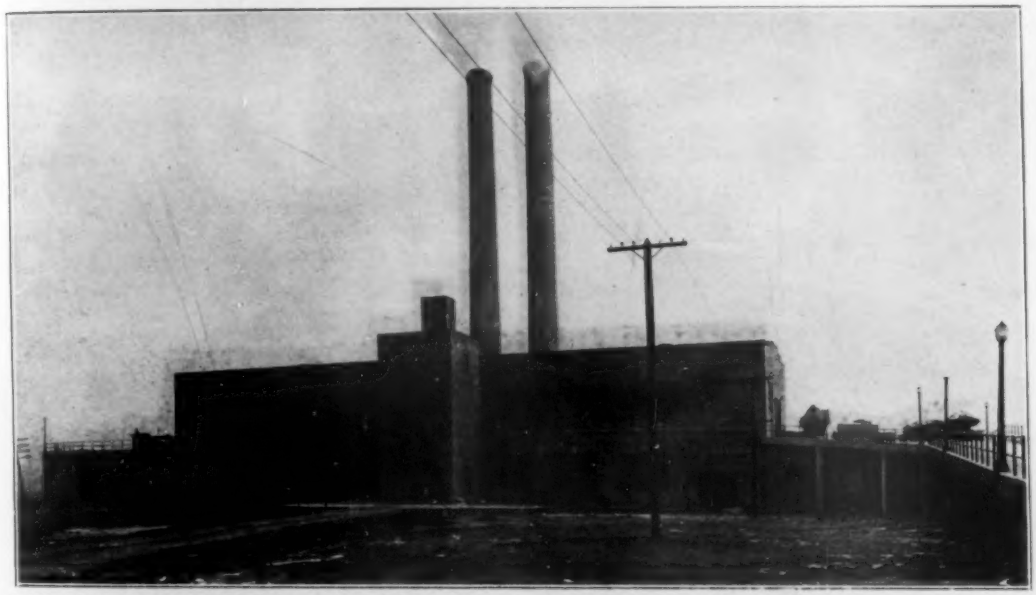
The first road-sweeping magnet was supplied with power from storage batteries carried on the truck. Since that time, however, these storage batteries have been replaced by gasoline-engine-driven generators. The latter outfits are much cheaper to operate than storage batteries and give continuous service on long stretches of road.

The New Refuse Disposal Plant in Buffalo, N. Y.

By Jos. H. Nichols

Mechanical Superintendent, Department of Public Works, Buffalo, N. Y.

THE city of Buffalo, N. Y., has had experience with practically all methods of refuse disposal. About two years ago it set about to make extensive studies of the problem to seek a solution which would to the maximum degree eliminate the unsanitary features met with in former methods. Metcalf & Eddy, consulting engineers, Boston, Mass., were retained to assist in these studies, which have resulted in the construction of a 500-ton incinerator located near Williams Street and the city line in East Buffalo.



EXTERIOR OF THE NEW BUFFALO INCINERATOR, SHOWING THE ASH SKIP HOIST IN THE FRONT AND BOTH ENTRANCE AND EXIT RAMPS

Incinerator Building

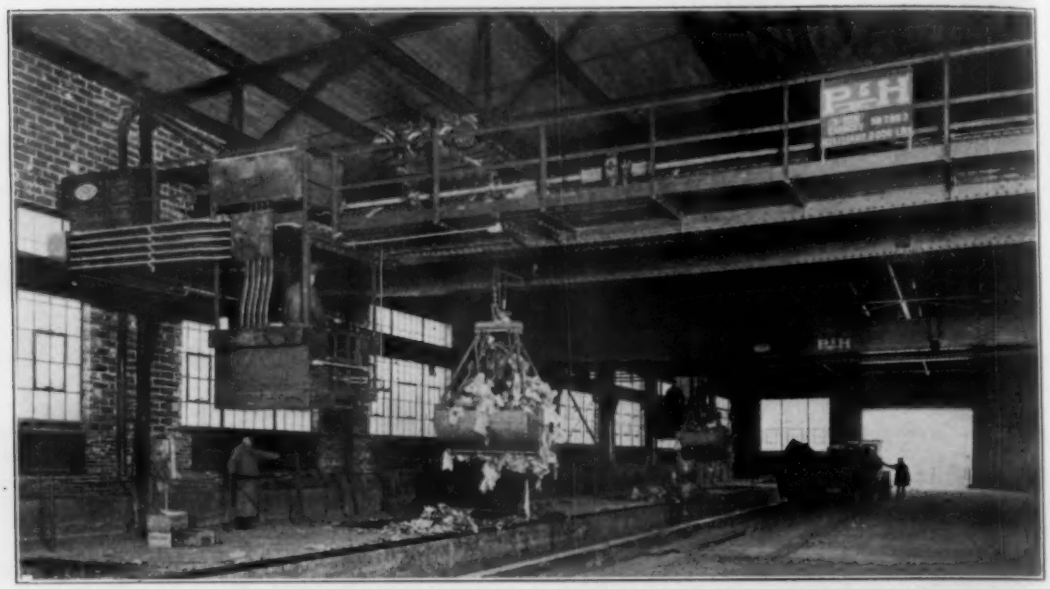
The incinerator building is a two-story brick and concrete structure 212 feet long by 82 feet wide. It is of reinforced concrete to about 3 feet above the second floor, and from that level the superstructure is of steel frame with brick curtain walls and large steel sash windows glazed with wire insertion glass throughout. A large yard is available for vehicular access to the various parts of the plant for the storage of trailers and the removal of ash and other service.

The entrance to the building is by means of a concrete ramp having less than a 6 per cent grade leading to the second story from New South Ogden Street. Exit from the building is in the opposite direction, or to the north, where a large area of turning platform allows the vehicles to return to the wide extrance ramp by means of a driveway over the furnace stoking-room. This feature of routing straight through the plant and returning over the roof of the stoking-room is novel.

The weigh-scales and weigh-office are located on this tipping floor. The refuse receiving bin which is 200 feet long, 13 feet wide and 16 feet deep, drops from this same level to within 3 feet of the first floor, thus creating a partition between the furnace room and the machinery room. On the tipping floor are the rest room, locker and toilet rooms with complete sanitary equipment.

An ash tunnel traverses the whole length of the building under the stoking-room and is served by electric dump-cars and an Otis ash hoist.

The area under the entrance ramp adjacent to the building is enclosed with brick curtain walls and is equipped for use as a truck and tractor garage. A similar enclosure under the returning platform is fitted for storage and a small repair shop. The superintendent's office



DUMPING FLOOR OF THE BUFFALO INCINERATOR, SHOWING CRANES TRANSPORTING GARBAGE AND REFUSE FROM THE PIT TO THE CHARGING BOXES

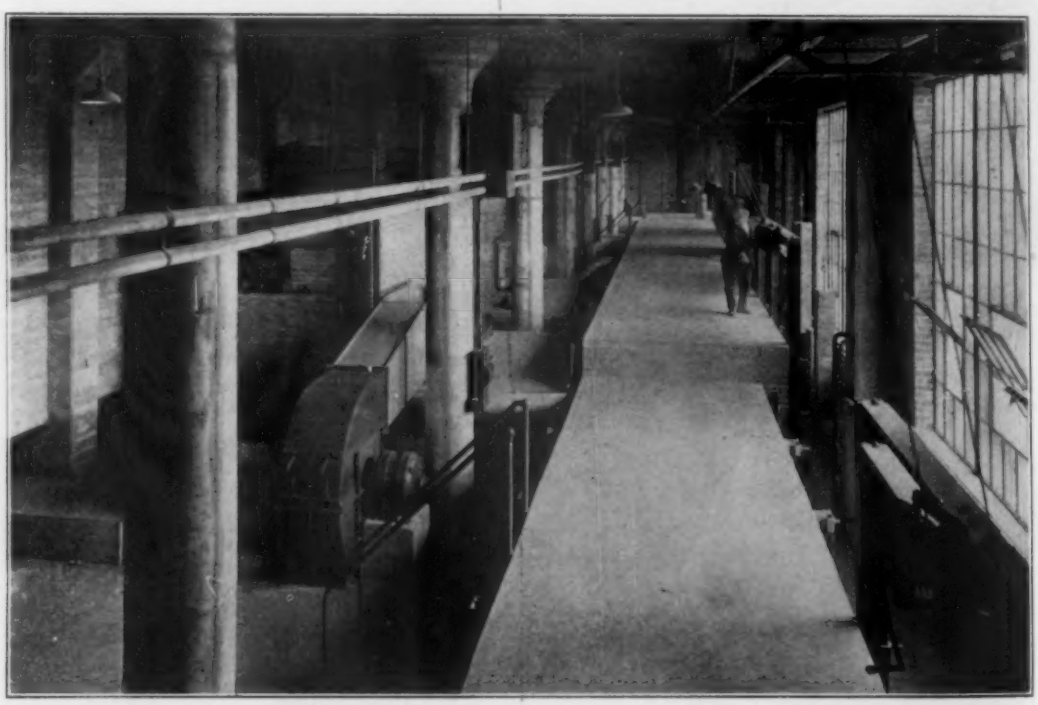
is located on a mezzanine at the south end.

The entire building is equipped with heating radiation, steam being supplied by an auxiliary boiler. Water and drain systems, together with liberal electric lighting, have been worked out to serve their respective functions.

Primary electric current at 2,200 volts, 25-cycle, 3-phase, is taken from the lines of the Buffalo General Electric Company. Transformers installed in a brick vault provide the 220-volt power circuit and 110-volt lighting circuit.

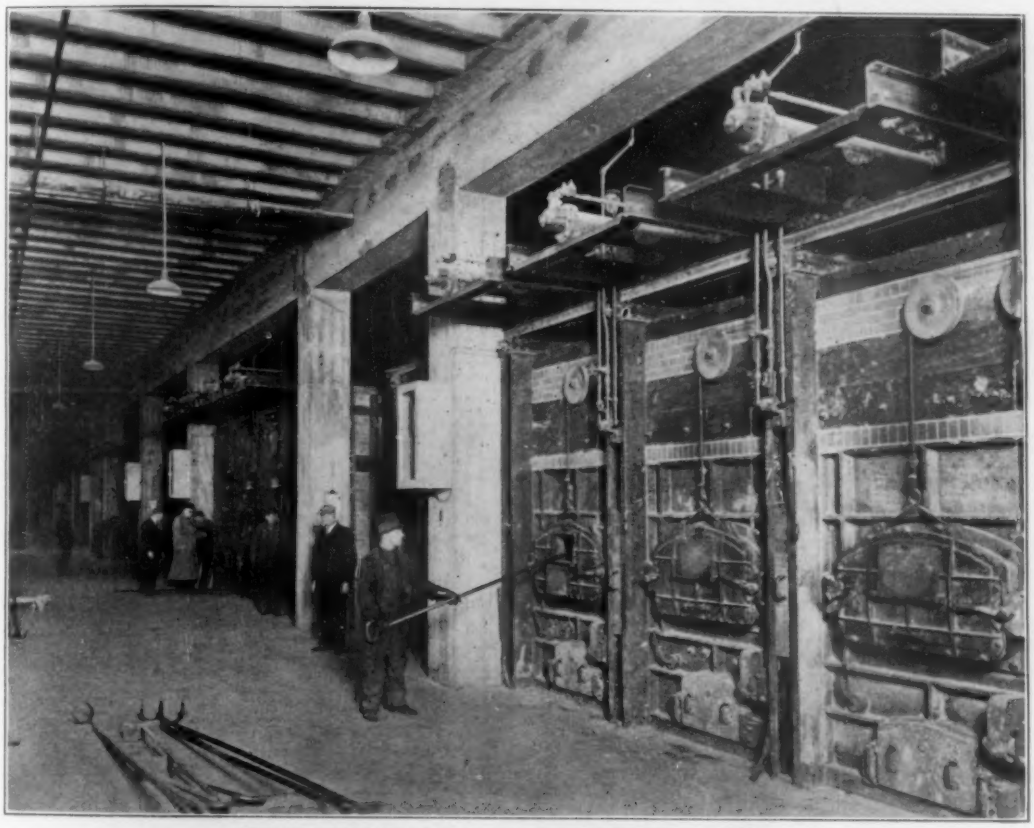
Electric Cranes

Two 3½-ton electric traveling cranes of 60-foot span, each equipped with a 2-cubic-yard clamshell bucket, serve to rehandle the mixed



CONNECTING FLUE, PREHEATER SETTINGS, AND FANS OF THE BUFFALO INCINERATOR

garbage and rubbish, from the receiving bin to the charging hoppers located above the furnaces. These containers are of steel and each consists of two legs separated by a steep angle crotch. As each furnace receives the mixed refuse through four openings, there are two of these charging containers per furnace. Side-dump trailers in trains of two or three units bring the garbage to the plant, the rubbish coming in large wagons. These wagons are fitted with chain hammocks which lie on the body floor and are made fast at the tail. The forward ends of the three chains are brought together in a ring which hooks under the driver's seat. When these wagons arrive at the plant and are backed at right angles to the dump log, the driver releases the hammer ring and hooks it to an auxiliary line from the crane trolley, and the crane operator starts the auxiliary drums and at the same time trolleys away from the wagon, thus raising the chain hammock and dumping the superimposed load into the receiving bin.



THE STOKING FLOOR OF THE BUFFALO INCINERATOR

Furnaces

Each of the five Heenan furnaces has a continuous grate divided into four cells. A section of the grate in each cell is so arranged that it may be manually dumped where cleaning of grates is necessary. This operation is called "clinkering." The ashes are thus dropped into an ash-pit, from which they are subsequently removed by the attendant of the ash tunnel. This feature marks an important advance in the design of destructors, as it effectually eliminates the dust nuisance from the stoking-room.

A large secondary combustion chamber receives the gases as they flow over the bridge wall. The main flue opening is so located in relation to the bridge wall that the gases acquire a rolling motion which accomplishes thorough mixing and maximum dust deposit in the combustion chamber.

The temperature of this chamber averages 1800 degrees Fahrenheit. A large brick-lined door in the front wall of the chamber affords an opening for the insertion of dead animals for cremation. The charges of mixed refuse are dropped into the furnaces by means of patented brick-lined gates which are actuated by compressed-air cylinders.

Accessories

Forced draft is employed to the full extent of furnace requirements. To make this more effective, a lateral type preheater is set in each unit, providing a down travel for gas through a bank of cast iron tubes set vertically in a steel box having heavy cast iron tube plates at top and bottom. The forced draft is supplied by motor-driven, direct-connected fans.

Brick-lined dampers of special design are so located in the main and bye-flues, that furnace regulation is facilitated. These dampers are operated manually through the medium of steel cables and worm-driven drums.

There are two chimneys, each 7 feet by 6 inches, and 175 feet high. They are of the radial type having an independent self-supporting lining with a large annular air space.

This plant was designed and constructed by the Hiler Engineering and Construction Company, Inc., Brooklyn, N. Y., United States licenses of Heenan and Froude, Ltd., Worcester, England. Elwin G. Speyer, an engineer of Buffalo, designed the building and ramps.

Sterilization of Municipal Water-Supply at Horton, Kans., by Ultra-Violet Ray

By N. T. Veatch, Jr.

Black & Veatch, Consulting Engineers, Kansas City, Mo.

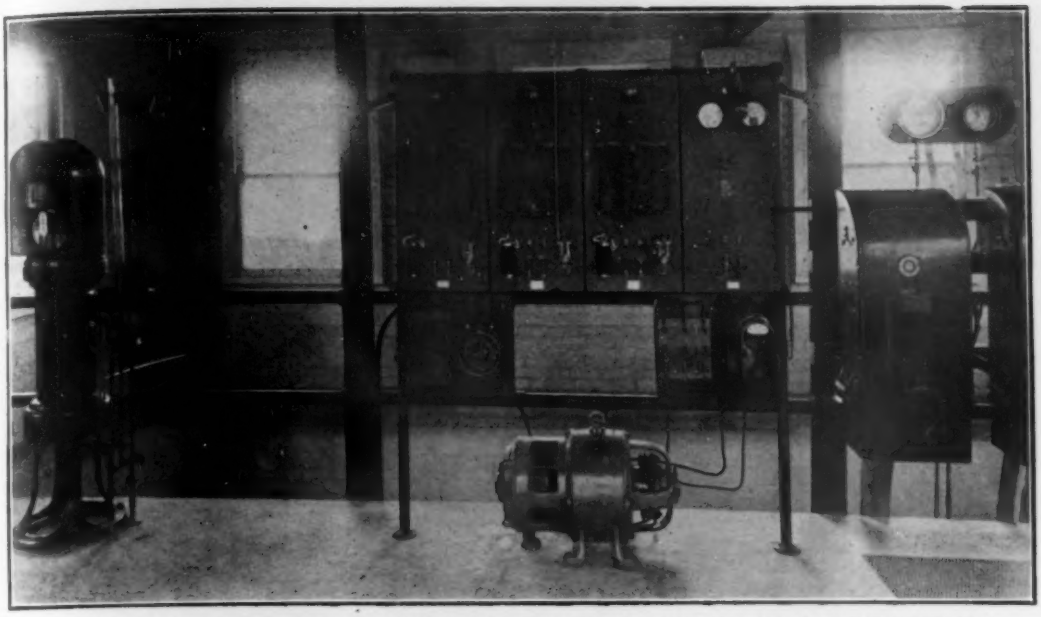
THE city of Horton, Kans., with a population of about 4,000, has just recently completed extensive improvements to its water-supply. The new water-supply is obtained from an impounding reservoir holding about 700 million gallons of water. The water flows by gravity from the reservoir to a purification plant located at the site of the municipal electric light plant. This purification plant consists of settling basins, rapid sand filters, clear-water well, and sterilization equipment, which is located in the high-service pumping-station.

The sterilization equipment consists of one ultra-violet ray machine, which was furnished by the R. U. V. Company of New York, and which has a capacity of 20,000 gallons per hour, with a power demand of 11.25 amperes.

The best description of the outfit can be given by the second and third illustrations. The second illustration shows the installation of the sterilizer, in the discharge line leading from the motor-driven high-service pumps. Attention is called to the by-pass shown in the foreground. The third illustration shows the motor-generator set and control panels all of which are located on the balcony floor of the pump house, just above the pumps and sterilizer in the pit below.

Table No. 1 gives the results of all analyses that were made between October 19, 1925, and March 5, 1926. These analyses were made by the Water-Supply Laboratory of the Kansas State Board of Health, which makes weekly analyses of all supplies in Kansas, where the cities are willing to pay the very small annual

MISSION LAKE, THE NEW 700-MILLION-GALLON IMPOUNDING RESERVOIR OF THE HORTON, KANS., WATER-SUPPLY

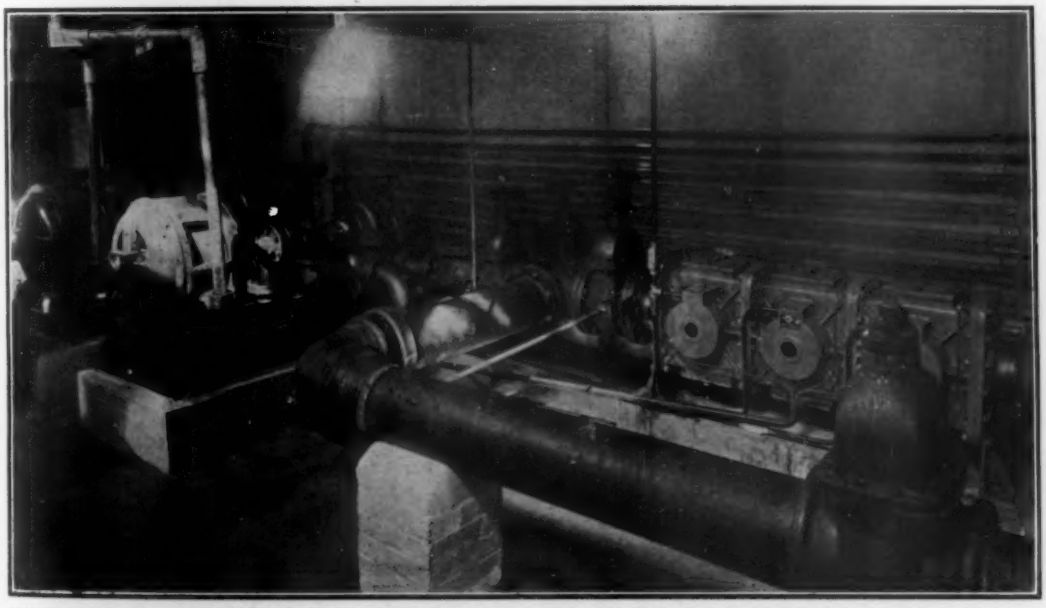


MOTOR GENERATOR SET AND CONTROL PANEL ON BALCONY FLOOR OF PUMP HOUSE

fee. The negative results of the tap water sample indicates the results obtained by the sterilization.

The installation of an ultra-violet ray sterilizer on municipal supplies is the exception rather than the rule. The conditions at Horton seemed to justify its installation at that place. The water reaching the settling basins at the plant is practically free of turbidity, except on occasions of extreme rainfall, and no trouble has been found in keeping the water applied to the filters at practically zero turbidity. The filter plant is in exceptionally good hands, and the filtered water has been maintained at a uniformly high standard.

The feasibility of using the ultra-violet ray at Horton is due to the probability of a continuously clear water and the opportunity to get electric current at cost from an efficient'y operated electric generating plant.



ULTRA-VIOLET RAY STERILIZER ON DISCHARGE LINE LEADING FROM THE MOTOR-DRIVEN HIGH-SERVICE PUMP OF THE HORTON, KANS., WATER-SUPPLY

TABLE NO. 1—BACTERIOLOGICAL RESULTS, CITY OF HORTON

Source]	Bacteria per c. c. on agar 37 deg. 24 hours	Fermentation, standard broth 37 C 48 hours, 3 tubes each dilution					Confirmation for B coli & Remarks	Turbidity	HC as Ca CO_3
		10 cc	1 cc	0.1 cc	0.01 cc	0.001 cc			
10-19-25									
Raw	650		1+2—	3—	3—	3—	+	140	78
Coag	4		3—	3—				0	22
Filt	1	3—	3—	3—				0	6
Tap	1	3—	3—	3—				0	6
10-26-25									
Raw	200		1+2—	3—	3—	3—	+	160	68
Settling basin	5		3—	3—				10	22
Filt	2	3—	3—	3—				0	10
Tap	2	3—	3—	3—				0	14
11-2-25 (reserve)	115		3—	1+2—	3—	3—	+	140	74
Settling basin	4		3—	3—				10	44
Filt	2	3—	3—	3—				0	20
Tap	1	3—	3—	3—				0	18
11-19-25									
Raw	400		2+1—	3—	3—	3—	+	140	74
Coag	3		3—	3—				15	28
Filt	2	3—	3—	3—				0	26
Tap	2	3—	3—	3—				0	22
11-16-25									
Raw	1200		2+1—	1+2—	3—	3—	++	70	76
Coag	9		3—	3—				0	30
Filt	5	3—	3—	3—				0	20
Tap	22	3—	3—	3—				0	18
11-23-25									
Filt	2	3—	3—	3—				0	46
Tap	3	3—	3—	3—				5	38
11-30-25									
Raw	225		3—	3—	3—	3—		40	76
Settling basin	5		3—	3—				10	28
Filt	2	3—	3—	3—				0	28
Tap	2	3—	3—	3—				0	28
12-10-26									
Filt	2	3—	3—	3—				0	36
Tap	1	3—	3—	3—				0	28
12-17-25									
Filt	1	3—	3—	3—				0	36
Tap	1	3—	3—	3—				0	24
12-28-25									
Tap	80	3—	3—	3—				5	56
1-4-25									
Raw	45		3—	3—	3—	3—		15	36
Settling basin	65		2+1—	3—			+	50	92
Filt	5	3—	3—	3—				0	48
Tap	2	3—	3—	3—				0	48
1-11-26									
Filt	11	3—	3—	3—				0	50
Tap	10	3—	3—	3—				0	46
1-18-26									
Filt	1	3—	3—	3—				0	56
Tap	2	3—	3—	3—				0	52
1-25-26									
Filt	7	3+	3—	3—			—	0	54
Tap	2	3—	3—	3—				0	52
2-4-26									
Filt	2	3—	3—	3—				0	52
School tap	1	3—	3—	3—				0	50
2-12-26									
Raw	55		2+1—	3—	3—	3—	+	30	80
Settling basin	14		3—	3—				0	46
Filt	3	1+2—	3—	3—			+	0	46
Hotel tap	1	3—	3—	3—				0	52
2-15-26									
Filt	3	3—	3—	3—				0	58
CH Tap	4	3—	3—	3—				0	48
2-22-26									
Filt	4	3—	3—	3—				0	62
Barber shop tap	6	3—	3—	3—				0	48
3-5-26									
Filt	55	3—	3—	3—				0	60
Hotel tap	375	3—	3—	3—				0	56

Chamber of Commerce Referendum Favors Special Assessments to Help Finance Rapid Transit Extensions

A referendum conducted by the Boston Chamber on the adoption of a new policy by the state of Massachusetts for the financing of rapid transit extensions and improvements, showed 70 per cent of those voting were in favor of adopting a new policy. Of those who voted for a change in policy, as stated in *Public Affairs* for February 21, 57 per cent favored the raising of a portion of the cost by special assessment on real estate specifically benefited.

As a result of this referendum the Chamber's Committee on Public Utilities has recommended to the Legislature that the plan proposed by the Metropolitan Planning Division be adopted so that future rapid transit extensions will be paid for by the Elevated and by assessment upon benefited property. The Elevated's share will be at least 70 per cent of the cost and the remaining 30 per cent or less will be assessed upon property specifically benefited over a wide area.

Competent Inspection a Necessity in Concrete Road Construction

By A. R. Hirst

Vice-President, L. R. MacKenzie & Associates, Washington, D. C.; formerly State Highway Engineer, Wisconsin

THE city of Do-Things wishes to pave a certain avenue. The city fathers decide that they will pave it with cement concrete. Promptly the proponents of concrete and everything possible to be used in connection with it besiege the City Hall with suggestions for the benefit of the job. The City Engineer listens more or less patiently, makes his surveys and plans, and draws his specifications. Every point is considered, every doubtful item weighed, and when the plans and specifications are turned over to the City Council they call for a very fine piece of work and workmanship.

The job is advertised and is, as usual, awarded to the low bidder. This happens to be Ignoramus Workwrecker, the well-known hay-wire exponent. The alderman from the ward, being one of the boys, is given the political plum of appointing the inspector. He names Donothing Buteat, whose principal occupation in life is gone since those nice buildings on the corner were closed and the rails and tables removed.

The specifications are left at the City Hall because neither the contractor nor the inspector could understand them if they had them. Besides, there is soon such an *entente cordiale* established between the two that such writings between friends are entirely unnecessary.

The Engineer is so busy in the office splitting hairs about the next job coming up that he is only able to visit this one a time or two for a few minutes. He finds many things not so good, but he is volubly assured by contractor and inspector that these occurrences are absolutely unprecedented, that up to that very hour the job was fine, and that the extraordinary combination of circumstances which caused the observed lapses cannot and will not happen again.

The job runs its course. It is finished, accepted, and paid for. The city of Do-Things has bought 40,000 square yards of pavement, for which it paid $160,000 total. No one knows what it got, how thick it is, what was the mixture actually used, how many seconds the concrete was mixed, or even approximately the modulus of rupture of the concrete. Pigs is pigs, concrete is concrete, a job is a job. As long as the plans are well drawn and pretty and the specifications are as rigid as thought and care can make them, what matters the actual construction?

The officials concerned have the quite usual alibi of weak engineering and management, a guarantee and a bond; which bond can, in ninety-nine cases out of one hundred, if it was ever really fought out, be blown so high as to be invisible.

Overdrawn? Not by a jugful, in too many, many cases. Too much of our American engineering is marked by meticulous care in getting ready plans for doing things and an absolute disregard for any effective control while the plans are being executed. Millions for fine pictures and legal verbiage, and hundreds for the only thing that can possibly guarantee delivery of what is specified—really intelligent and careful inspection of materials, mix, work, and workmanship as the work progresses.

Someone has said that the curse of American public life is the ever present urge to draw and pass resolutions on every conceivable subject and then forget the subject. It can be just as well said that the curse of American public construction is the overwhelming urge

Give Concrete a Square Deal

In his discussion before the American Society for Municipal Improvements, A. R. Hirst, formerly State Highway Engineer of Wisconsin, has laid before city engineers, in a very forceful manner, conditions as they actually exist today in concrete highway construction. "We have made a sort of fetish of concrete. It behaves so well when robbed and neglected that we think it is able to stand anything, but if we inspect carefully many of the concrete pavements of some age in service which fared badly in design or construction or both, even the most hard-boiled concrete worshipper must be shaken in his idolatry of it. Concrete will not stand up unless it is built so that it can stand up. It is just as fallible as other materials of construction. Treated with care and intelligence, it will give back generously; treated like a stepchild, it can give us no more than we give to it."

of public officials to exhaust their energy in making magnificent pen-and-word pictures of things to be done, to be promptly filed away until they are used to draw still finer word pictures for the next job.

Men who never built a good job in their lives enjoy excellent engineering reputations because they fling a wicked ruling-pen and can out-legalize any ordinary lawyer in drawing specifications that no one understands, and which are therefore judged to be the last word on the subject. Many engineers will debate for hours this or that controversial point about concrete before writing their last word in specifications and their actual work looks like something the cat brought in.

The programs of most technical meetings are made up of learned dissertations on how to design and build pavements, delivered by men whose sole construction accomplishment is the writing of books and delivery of lectures. We rather face an over-supply of experts without portfolios. The theorist and slide-rule shark who builds pavements in a shed in the back alley is getting the better of the horny-handed sons of toil who really do design and build pavements for service.

Far be it from us to belittle the work of the expert in laboratory and field. It is a required part of the whole, but I am sometimes driven to wonder if it is not about time we put into practice on construction more of the things we do know before we allow our theories to get too far ahead of our practice.

Unfortunately, also, the average public official and engineer is so occupied with the multiplicity of things which must be done that in many cases he has not the time to separate the wheat from the chaff and often takes his opinion and his practice ready-made from men and organizations that have a perfectly legitimate but selfish commercial purpose to serve. Too many engineers and officials are not thinking for themselves. They are allowing others—often others with axes to grind—to think for them.

It is easy to be a follower, a "yes" man, and so hard for many to take the responsibility which comes from a personal determination of a course of action. We find the woods full of men holding to their public jobs like grim death by pursuing a course of masterly inactivity and refusing to choose or act for themselves, as long as they can take the easy course of just following what someone else advises or is doing.

These chair-warmers are proud of their reputations and super-careful to protect themselves from any possible criticism. They add an inch or two or three of concrete here, several hundreds or thousands of bags of cement there, many tons of steel here, whether they are needed or not. It is far better to soak their clients, the taxpayers, a few extra thousand dollars, than that they should run the slightest risk of criticism.

Then to make themselves super-safe, they require a maintenance bond, so that the contractor may possibly be held liable even if their job of engineering is poorly performed and their inspection is as rotten as they expect it to be. And several hundreds or thousands of dollars more is shot to make the job safe for a Democrat or Republican. We need more intestinal stamina in our engineering departments. Lack of it is costing us a lot of poorly built pavements and millions in excess prices.

Most local municipalities adopt the specifications of larger cities or of some association or of the state, and these in turn were largely copied from something else. Scissors and paste-pot specifications, however, do no great harm. Many specifications may be obsolete, but the worst, if followed, will produce fair results. If even ordinary plans and specifications were translated into practice, our pavements would be infinitely improved.

I have many times stressed the thought that the American people are almost always willing to spend money to gain a desired result, but that they are not so willing to spend money for proper engineering, although that situation is lately much improved. But they have never been willing to spend money for efficient and proper inspection. I know it to be a fact that many public bodies have to largely camouflage their engineering and inspection costs in order not to arouse public protest; this, even though adequate inspection costs an incredibly small portion of the whole cost of a modern pavement.

General conditions existing as to concrete bases and pavements do not vary from those affecting other types, except that, inasmuch as concrete used as a wearing surface is a recent development in paving, there has been more variety of opinions and practice in recent years in concrete pavement than in the older established types.

In the last five years, we have learned much about the properties and conduct of cement, sand, water, and coarse aggregate when intimately mixed, of the resulting concrete and of the resulting slabs. For this knowledge, we owe many individuals and organizations. Credit is especially due to the testing department of the Portland Cement Association under Professor Duff Abrams, to the Illinois Highway Commission, and to the U. S. Bureau of Public Roads.

Some characteristics of the materials of con-

crete and of concrete slabs seem to have been quite definitely established, all other things being equal, at least to the satisfaction of a large fraction of those who know something of concrete construction. We have summarized below some of these established facts. Many engineers and proponents of certain materials and methods will not agree that certain of these things are established. However, honest differences of opinion and debate thereon always make for real progress. The curse of concrete has been and is that too many things have been considered as gospel which were only partly true or were and are absolutely untrue.

1. The strength of concrete varies directly with the amount of mixing water used. The more water the less strength, the less water there is used, providing it produces a concrete which is workable and free from voids, the stronger the concrete.

2. The amount of water needed to make a workable mortar increases with the amount of sand used. Therefore, the more sand in the mixture to the bag of cement, the weaker the mortar.

3. The voids in the coarse aggregate determine the amount of mortar required to make a dense concrete, and, therefore, the larger the voids, the weaker the concrete for an equivalent amount of cement.

4. Sand has not a constant volume. Its volume when thoroughly wet and when thoroughly dry are approximately the same, but when moist it bulks, and unless correction is made for this bulking, the resulting mortar will be less than expected and the slab possibly deficient in mortar for filling or finishing or both.

5. Slabs must be well cured if the maximum strength of either surface slab or base is to be developed. There is about as much reason for well curing bases as for curing surface slabs.

6. Concrete stressed to over 50 per cent of its ultimate strength is dangerously weak under many repetitions of loads. In other words, it is dangerous to count on more than one-half of the modulus of rupture of the concrete when computing the safe depth of a concrete slab for a given load.

7. The character of aggregates used should vary the finishing methods used. Gravel coarse aggregates densify with less manipulation than angular aggregates, the latter often bridging toward the bottom of the slab unless tamped or agitated, especially if proper dry mixes are used.

8. No concrete slab attains the maximum beam strength for the mixture used unless it is free from voids, especially at the top and bottom of the slab.

9. There is apparently no definite relation between the compressive strength and the beam strength (modulus of rupture) of concrete. If the beam strength (modulus of rupture) is high, the compressive strength will always be ample for all compressive purposes.

10. Too high cement content often produces trouble by causing excessive contraction and expansion in slabs.

11. The beam strength of concrete is adversely affected when the slab is moist. The greater the voids, the greater the possibility of moisture in the slab, and the less the strength in moist spells. Voids in the bottom of the slab are especially objectionable.

12. The character of the coarse aggregate used affects the surface wear very little under rubber-tired traffic, but the harder and tougher the coarse aggregate used, the less the wear under chain traffic, which may often be destructive.

13. Smoothness or roughness in the subgrade may have more influence on crack formation or lack of it than many other factors. There is some indication that we may ultimately lay some foundations of sand, cinders, stone dust, or sandy gravel to enable us to produce a really smooth subgrade and one more free from water troubles.

14. It is not true that concrete can be manipulated too much in its laying. The best concretes are the densest concretes, and under many conditions dense concrete cannot be produced without manipulation of some kind unless water is used greatly in excess.

15. Surplus mortar in the slab or on the surface of the slab is a source of weakness, not of strength. The less mortar over that positively required to finish a dense slab with the methods used, the better the final results.

16. Not only are dirty materials bad, because they usually reduce the strength of the concrete, but they are worse, because they are the most common cause of surface scaling, especially if the mortar is in excess.

17. Freezing and thawing of concrete slabs is a danger to their continued existence, too much disregarded. This danger is ever present in regions subjected to freezing and thawing spells and is much increased if the slabs are not dense.

Each of these fundamental principles is subject to so many modifications to fit conditions that it would require a volume to discuss them. Within broad limits, I believe that every one of these propositions is conceded by most engineers to be sound and proven, and, if we were mindful of these points in our practice, won-

ders could be wrought. The unfortunate part of the matter is that an astoundingly small percentage of American highway organizations pay any marked attention to many of them in their actual planning or construction practice.

In the average American paving specifications, both of base and of slabs subjected to wear without other covering, we revert back to the common standards of twenty years ago in specifying that the materials used shall meet certain requirements which vary widely in various units of government. Within any of these specifications completely met, resulting concrete can be built which will vary 50 per cent or even more from other concretes which can be built with other materials meeting the same specifications.

It would seem only sound business to pay for what we are getting in materials. If certain materials produce much stronger and better concrete than other materials, it should be possible to encourage their use by fitting the slab to the materials. Theoretically, we desire a slab of a certain strength. The materials and methods which produce that strength at the minimum cost are the ones to use.

Decide What You Need—Then Build It

I am one of the comparatively few American engineers who believe that we shall not be really on the right track in the construction of concrete pavements and bases until we learn to establish what we need and then really build it. In other words, in a concrete pavement or a concrete base, we must first assume the loads which will be expected to use the structure within its life. That having been determined, we can determine the depth of concrete for a given modulus of rupture required to sustain these loads throughout the life of the pavement. If that depth is 8 inches of concrete with a modulus of rupture of 600, we are flirting with Providence if we, in fact, build 8 inches of concrete with a modulus of rupture of 300.

The precise means we are going to use to determine instantly that we are in fact getting concrete of at least the determined modulus at 30 days, is not absolutely clear. Probably a simple cantilever test of cast beams at 24 hours will give a fairly close check if supplemented by a careful watch of the water-cement and cement-sand ratios and the mixing time. The problem of an early test of beam strength and calibrating them with standard long-period tests is one of the most important now before us.

The commonly accepted formula used in American pavement design at this moment was developed by the Illinois Highway Department as a result of the Bates Road Test. This formula gives the required depth of the unsupported corner of a concrete slab. The formula is

$$D = \sqrt{\frac{3\,W}{S}}$$

Where D is the required thickness of pavement at an unsupported edge, W is the expected maximum load on a single wheel, and S is one-half of the modulus of rupture of the concrete to be used. Illinois further demonstrated that the required depth of the slab where it abuts against another slab with adequate dowels between the two is 0.7 of the edge depth ascertained by this formula.

This formula is soundly derived and the arithmetical results are well checked by results in experiments and practice. It gives the following required edge depths for various moduli or rupture of concrete:

11.6 for 400 pounds modulus of rupture
10.4 for 500 pounds modulus of rutpure
9.5 for 600 pounds modulus of rupture
8.8 for 700 pounds modulus of rupture
8.2 for 800 pounds modulus of rutpure

This is for the 9,000 pounds allowed for single wheel load, which is about the American average loading. If we believe this formula is sound, the problem of designing a concrete slab for a given load is simple, if we know the modulus of rupture of the concrete we are going to, in fact, get on the job. That's the rub. What modulus of rupture are we going to get? Few of us have known so far either before or after the job was built.

We design slabs for a definite purpose and ostensibly fit the slab to serve that purpose—and then we build almost anything and call it a day and a job. More often than not, we don't even suspect how near or how far we come from building the strength we said we needed when we made the plans and specifications. In most cases we don't seem to care what we get, as long as we get something which looks something like what we said we must have.

Why? The principal reason is the fact that we have made a sort of fetish of concrete. It behaves so well when robbed and neglected that we think it is able to stand anything. But if we inspect carefully many of the concrete pavements of some age in service which fared badly in design or construction or both, even the most hard-boiled concrete worshipper must be shaken in his idolatry of it.

Concrete will not stand up unless it is built so that it can stand up. It is just as fallible as other materials of construction. Treated with care and intelligence, it will give back

generously; treated like a stepchild, it can give us no more than we give to it.

It is the duty of American engineers to generally recognize the real fault of concrete pavements and bases and to take steps to meet and correct them as far as the circumstances permit. We have been ostriches with our heads in the ground too long, blind to things which are happening before our very eyes. The way to correct an evil is first to recognize that all is not well, then find the causes and correct them. For some time to come engineers will have plenty to do if they will un-deify concrete and by careful and prayerful work start again with a full conception of its manifold possible virtues and its almost as numerous faults.

In our humble opinion, it is not at this moment so much a matter of more investigations and experiments or finer-drawn requirements in plans, specifications, and testing. We know much about concrete as a result of fifteen years of building, experiments, tests, and studies. What we need to do now is to put into practice in our planning and construction that which we do know.

If we will only do this, the American people can be given a much larger dollar-for-dollar value for their investment in concrete pavements and bases. We need three things to bring about this result:

1. Adequate design and specifications based on now well-established facts
2. Intelligent and complete inspection
3. Competent and fairly paid contractors

To attain these three things is, we concede, difficult. If they were easy, we should have had them and it would not have been necessary to write this discussion. However, to do so is not impossible. American constructive genius has conquered many problems as difficult, and it can accomplish this if it is ever aroused to do so. But self-complacency never accomplished a reform.

ACKNOWLEDGMENT.—From a stenographic report of an extemporaneous talk before the Washington, D. C., Convention of the American Society for Municipal Improvements.

New Street-Lighting Construction Begins in Columbus, Ohio

COLUMBUS, OHIO, two years ago called the street-lighting laboratory of America, because of the number of sample installations of street lights which had been made in the streets there, has now begun actual construction. An extensive report of the demonstration was made by the Chamber of Commerce (see THE AMERICAN CITY, May, 1924, pages 478-481), and copies were forwarded to various chambers in many cities and ballots were distributed to the residents so that they could indicate their preferences in regard to the type of lighting. Now, only a short time after the sample installations were made, Columbus is making the initial step toward the adoption of a uniform lighting system. The main business district of High Street, the main thoroughfare of the city, is to be equipped with intensive White Way units, the secondary business district of the city with less intense illumination, and still another type of the same general design for the residential part of the streets beyond the business section.

More than 500 lighting units of four types are to be installed along the street. Of these, the main business section will include 96 twin units with blue-tint medium alabaster rippled globes and canopies. The lamps will be of 1,500 candlepower each, with light centers 20 feet above the ground.

In the secondary business section, 166 units will be used. These will be equipped with 1,500-candlepower lamps at a height of 16 feet. They will have medium alabaster rippled globes and canopies.

Between the secondary business and residential sections, there will be 18 units with 1,000-candlepower lamps to prevent too great a decrease in intensity of illumination, such as would prevail if 600-candlepower lamps were placed next to the 1,500-candlepower units. Except for the lamps, the units will be similar to the 166 units of the secondary business section.

The 143 units for the residential section will be equipped with 600-candlepower lamps and will have light alabaster rippled globes and canopies with asymmetric dome refractors. Light centers will be 13 feet above the ground.

Each single-light standard will be equipped with disconnecting pothead type transformers and each twin-light standard will have two such transformers in the base, one for each lamp. There will also be seventeen subway type transformers, six subway type contactors, and two automatic pole type contactors. All of the electrical equipment will be supplied by the General Electric Company, and the poles, except where the old poles are being remodeled, will be Union Metal Manufacturing Company units.

On pages 240 to 253 of the 1927 Municipal Index appear statistics covering the number, sizes, and contract prices of street lights in over 1,000 cities of the United States.

Death and Destruction at Grade Crossings

Recent grade crossing accidents give evidence that this game for high stakes goes gruesomely on. The photograph above shows all that remained of an automobile after it was hit by a railroad train at Grove Street crossing, Montclair, N. J. A woman was killed, and her husband and three other men were injured. The picture indicates how thoroughly the car was ripped apart.

Below is the tangled mass of wreckage which resulted from a grade crossing accident at Kensington, Md. Five persons were killed, four of them in one family.

P. & A. Photos

Municipal Hydro Plant and Street-Lighting System, Watertown, N. Y.

By J. Walter Ackerman
City Manager, Watertown, N. Y.

PRIOR to the present form of city manager government in Watertown, N. Y., the water, light and power department was governed by a specially created board of commissioners who had complete charge. A number of years ago they acquired a water-power right at the site of the present water-works plant. This development was adequate for their aims at that time, but later it was realized that more power would be needed in the future. Recognizing that they had a valuable water-power right in 1897, the board began to acquire title to land and water flowage rights.

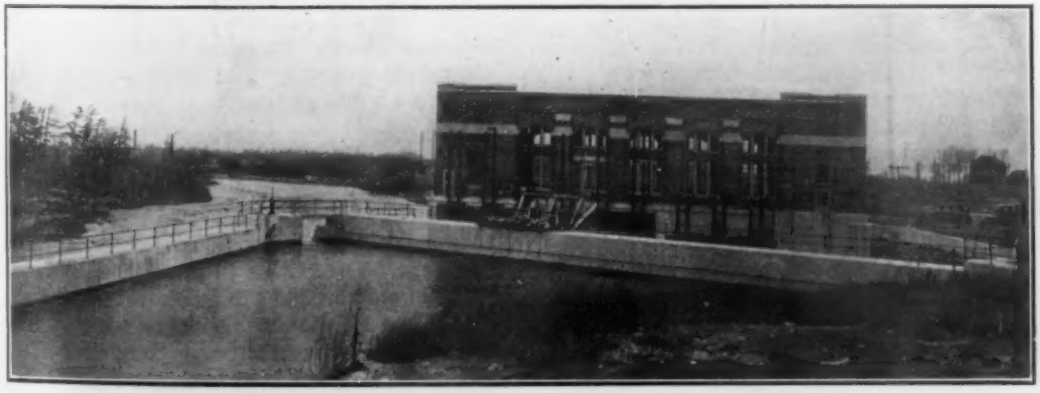
The Hydroelectric Plant

The hydroelectric plant, which was completed about eighteen months ago, is conservatively estimated to be worth at least $1,500,000. It is now being operated to supply power for pumping water and lighting the filter plant and pump house, the boulevard bridge, the streets, and public buildings.

The hydro plant is located near the outskirts but within the city limits and is immediately across the Black River from the municipal filter plant and pump house. The Black River is a stream whose tributaries rise in the Adirondacks, and within recent times, under an instrumentality of the state, a storage reservoir has been built to prevent floods in the spring time and to conserve the flow of the river during the flow of low water. This is equivalent to a lake 10 miles in area and about 30 feet in depth. The Black River in the region of Watertown flows through an almost solid rock foundation of limestone, so that the headrace, forebay and tailrace all had to be excavated out of solid rock. At this particular point in the river there is an island which necessitated the building of two dams instead of one in order to secure the 26-foot head available for power purposes.

The expense of excavating the headrace, about 800 feet long, was large. The headrace is rectangular in section, being a little more than 50 feet wide and 20 feet in depth from the water line to the bottom, giving a cross-section of over 1,000 square feet. As the maximum flow through the turbines is approximately 1,000 feet each, the headrace velocity can never be above 3 feet per second. The site of the power-house is an old quarry pit, and because of this enlargement, the trash racks are about twice as wide as they are commonly made for this flow of water. Since this plant is in a northern latitude and the locality is somewhat subject to anchor or frazil ice, the precaution taken of building this large-area rack is really an insurance against these troubles.

The substructure of the power-house is mass concrete up to the floor level of the generators. The scroll intake and the customary draft tube were molded around wooden forms which were built on the bank in sections and lowered and anchored in place. The power-house proper is built of tapestry brick of a pleasing design without any special ornamentation, and the interior is fitted with the customary electric crane of sufficient capacity to handle any unit in the plant. All of the wiring in the plant is in con-



FOREBAY OF WATERTOWN MUNICIPAL HYDRO PLANT, WITH STATION IN BACKGROUND

WATERTOWN, N. Y., MUNICIPAL HYDROELECTRIC EQUIPMENT AS SEEN FROM STATION BALCONY

duits in an upper foot of concrete, which was laid after all of the piping was in place.

The equipment of the plant includes three vertical type hydraulic turbines made by the S. Morgan Smith Company, rated at 2,700 horsepower maximum under a 26-foot effective head operating at 120 r.p.m. Each turbine is installed in a concrete scroll case and discharges through a concrete draft tube. Woodward governors are installed for each unit.

Two generators have been installed and all provisions made for the installation of a third unit. The Westinghouse generators are of the vertical type direct-connected to the hydraulic turbines and are rated at 2,250 kv.-amp. at 80 per cent power factor and 50 degree rise. Current is generated on a three-phase, 60-cycle system at 2,300 volts. Each machine is provided with its own individual 250-volt direct-connected exciter of 45-kilowatt capacity.

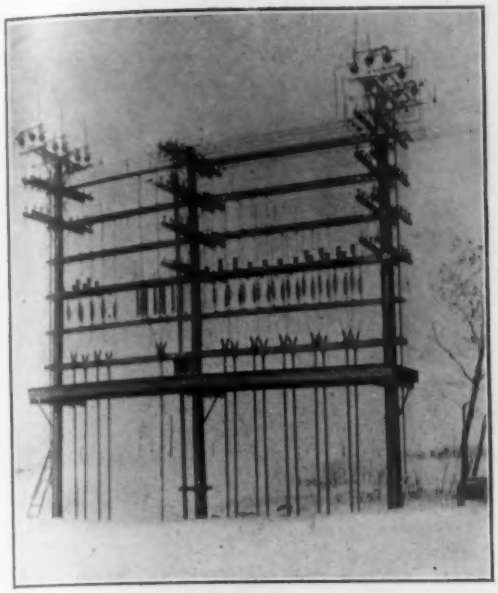
The switching equipment in the station consists of a 13-panel switchboard which takes care of the generators and the feeders both in the plant and outside. The three generator panels are equipped with the usual arrangement of indicating instruments and non-automatic hand-operated oil circuit breakers. Completely equipped feeder panels take care of the power line to the pumping plant one-quarter of a mile distant, a line which feeds to the municipal buildings, a station power service, and a street-lighting feeder. Four other panels, used in connection with the street-lighting system, are described later.

New Street-Lighting System

The city of Watertown has abandoned the old system of street lighting and installed an entirely new one covering in a systematic and graduated manner all parts of the community. A series system is used throughout with directional lighting units. Watertown is the only city in the country that has attempted a complete new system with complete installation at one time.

The old system consisted of approximately 300 ornamental posts located about the public square and for two or three blocks out on the radiating principal thoroughfares. Beyond this point, the principal street intersections were lighted by carbon arc lamps and some secondary points by 60-watt incandescent lamps, mounted underneath a metal reflector, supported by an iron bracket on a pole. The ornamental posts were of pressed metal having a double bracket at the top supporting five- or three-light clusters. The lights were 60-watt lamps with ball globes.

The new system conprises 1,223 ornamental cast iron posts fed by underground cables and equipped with octagonal lantern type tops provided with reflecting and refracting glassware to give controlled directional lighting. These posts are 16 feet high to the light center for those located around the public square, and 12 feet to the light center on the outlying streets. The ornamental system completely covers the city within a radius of one-half mile of the Public Square. The remainder of the city is



POLE RACK AT EDGE OF NEW STREET-LIGHTING DISTRICT, WHERE OVERHEAD LINES GO UNDERGROUND

lighted by wires carried overhead on pole lines and including 527 pendant fixtures suspended from 16-foot mast-arms upon poles. The pendant fixtures are also provided with reflecting and refracting glassware.

Starting from the municipal power-house located at the edge of the city, a feeder pole line circles the city just outside the edge of the ornamental post lighted district and carries the wires feeding the entire system. Each separate circuit is carried on it from the power-house to the point at which that particular circuit begins and terminates, these feeder wires dropping off the pole line and feeding in by means of underground cables to the ornamental posts and feeding out on the pole line comprising the overhead mast-arm pendant lighted part of the system.

Lighting Intensity

On the Public Square and on Washington Street from the Square to Sterling Street, which represents the highest property value and the larger and best commercial district, there are 300 lumens per lineal foot of streets; in the secondary business district, 160 lumens per lineal foot and in the outlying business districts, from 60 to 80 lumens; in the purely residential district, the illumination runs about 40 lumens per lineal foot. In the outer district of residential lighting, where there are pendant lights, illumination is at the rate of from 10 to 16 lumens per foot of street.

Incandescent lights of 600 candlepower are used on the main arteries into the town on the pendant lights, the other pendant lights being 400 candlepower with 250-candlepower ornamental post lights used in the residential district. The outlying business districts have 400-candlepower ornamental lights, the secondary business district 600-candlepower lights, and the most intense lighting is with 1,000-candlepower lights on 16-foot posts, all the others being 12-foot posts.

NUMBER OF LIGHTING UNITS

72	10,000-lumen lamps on ornamental standards
140	6,000-lumen lamps on ornamental standards
611	4,000-lumen lamps on ornamental standards
401	2,500-lumen lamps on ornamental standards
76	6,000-lumen lamps on overhead mast-arms
451	4,000-lumen lamps on overhead mast-arms

The cost of installing the complete system was $416,000. The poles for carrying the lighting circuits to the underground circuits and also to the overhead circuits and the 2,300-volt transmission line which encircles the city, from which all of the public buildings are lighted, are of a very superior type of western red cedar as straight as candles, and are of sufficient height and strength so that if the city desires to distribute current for domestic and other lighting, no changes will have to be made in the 1,963 poles already in the system.

Spacing and Equipment

In the Public Square, the lights are spaced 65 feet on centers, on the principal streets from

OVERHEAD MAST-ARM SUSPENSION WITH REFLECTOR AND REFRACTOR

80 to 85 feet on centers, and in the semi-business and principal residential districts the spacing is from 100 to 110 feet. In the remainder of the residential district, the spacing is 120 to 130 feet. All posts are staggered, with the exception of two blocks on Massey Street, which is an extremely wide street, so that parallel or opposite spacing gives better lighting. The spacing mentioned above is from post to post on one side of the street, so that the spacing on the street center would be half the figures given.

All posts are equipped with Bi-Lux refractors, which produce a graduated distribution of light rays upon the street surface by means of reflecting and refracting prisms which are designed to build up two wide paths of light diverging in opposite directions up and down the street. The posts in the Public Square have glass canopies so as to allow the light to illuminate and reflect from the front walls of the high buildings. The remainder of the posts have solid metal canopies and are equipped with white enamel metal reflectors in the top of the lanterns above the lamp so that they reflect the light rays downward onto the street surface. The posts on the Public Square are provided with insulating transformers having a primary winding of 6.6 amperes with current at approximately 5,000 volts, and secondary winding for 20-ampere current at approximately 26 volts. These transformers are connected to the underground cable on the primary side by disconnecting potheads so that they can easily be removed for repair or replacement in case at some later date larger lamps are used. The remainder of the posts have disconnection potheads in the base of the posts so arranged that in case the post is knocked down, the side connected with the wire going up the post will pull out automatically,

WESTINGHOUSE LIGHTING STANDARD OF TYPE USED IN WATERTOWN, N. Y.

short-circuiting the post, thus allowing the rest of the system to burn and at the same time eliminating the danger of having high voltage in the post and the fixture lying on the ground. Fixture sockets are provided with film cut-outs which puncture and short-circuit the lamp out of service in case it burns out, allowing the rest of the system to burn.

Overhead lights are placed at each street intersection and in the center of each long block or so as to divide each extra-long block into thirds. They are suspended from 16-foot mast-arms placed approximately 28 feet above the ground. They are dust-proof fixtures, having

HIGH-INTENSITY BUSINESS STREET LIGHTING IN WATERTOWN

sufficient space in them to allow for an auto-transformer to be installed at a later date if desired, thus permitting the use of higher candlepower lamps provided with a 20-inch metal reflector enameled white below so as to reflect the light downward and with 8½-inch reflecting and refracting glassware of the closed-bottom double-bowl type. The mast-arms have cut-out pulleys so as to short-circuit the entire fixture when lowered.

Arthur L. Mullergren, consulting lighting engineer, Kansas City, Mo., was the consulting engineer for the work. William H. Cushman, hydraulic engineer, Watertown, N. Y., and George C. Diehl, Buffalo, N. Y., were in charge of the design of the plant, assisted by Paul B. Sutton, City Engineer, and the writer. Charles A. Pohl, of New York, wrote the specifications for the generating units. The Donovan Construction Company, St. Paul, Minn., were the contractors for construction. Westinghouse equipment was used throughout.

Snow Removal Cheaper Than Clogged Roads

HIGHWAY officials in 36 snow states reported to the U. S. Bureau of Public Roads a program of open roads for this winter which aggregates 92,756 miles. Last winter the road mileage cleared of snow in these states was about the same, compared with 62,165 miles in the winter of 1924-25. The estimated expense of snow removal last winter was $4,000,000. Enthusiasm for keeping roads open for winter traffic is so keen in some states that taxpayers insist on snow removal even if the funds required for the purpose curtail road construction.

In a study of snow-removal problems, the Bureau of Public Roads points out the economic importance of snow removal. Formerly the movement of farm products to the city was discontinued during the winter months and necessary commodities were procured for consumption by country people in the fall. Country storekeepers, especially those doing business at a distance from railroad stations, had to stock up before the first snowstorm and were saddled with a heavy investment for holding merchandise until required by consumers. This condition lasted until motor vehicles came into general use and the rural public began to call for improved roads.

It soon came to be realized that improved roads did not yield anything like the maximum possible return on the investment made in them unless they were open to traffic during the entire year. It was also felt that costly motor vehicles without roads to carry them tied up much capital unprofitably. The 36 snow states in 1925 had 375,774 miles of surfaced rural roads and 16,139,859 registered motor vehicles. From 1921 to 1925, inclusive, they expended about 3¼ billion dollars on highway improvement and maintenance. It has also been estimated that their registered motor vehicles in 1925 involved a purchase cost of approximately 14½ billion dollars. It is obviously uneconomic to have the transportation facilities represented by this investment in road improvements and motor vehicles put out of use annually for several months by snow. In the heavy snowfall area where snow removal is not carried on, the advantages of paved roads and motor vehicles may be interrupted for three or four months in each winter. Progressive rural populations with a large investment in good roads and motor vehicles are becoming less and less inclined to tolerate this condition.

So strong is the demand from taxpayers for more extensive snow-removal programs that it is believed that it will not be many years before all paved roads and their connecting sections in the United States will be kept open for year-round traffic. Accordingly, a study of snow-removal expense in various states is now being made to ascertain the best and cheapest methods. Straight-blade and V-shaped plows mounted on speed trucks are extensively used. New Jersey, with her average annual snowfall of 31.8 inches and 1,270 miles of road to be kept open, uses the straight-blade, truck-mounted plow almost exclusively. For opening drifts or packed sections of roadway, or for widening roads already made, powerful displacement plows with tractors and various types of rotary plows are employed. Operating costs are lower for truck plows than for tractor plows. Newly fallen snow to a depth of 9 inches, and short sections of snow recently drifted but not packed or encrusted, can be efficiently removed with truck plows. The U. S. Bureau of Public Roads observes that snow rarely falls at one time to a depth greater than 9 inches. Indeed, the greater number of storms deposit only from 2 to 5 inches of snow. Storms depositing 5 and 7 inches or more are comparatively rare. Snowfall depths are often greatly exaggerated.

The costs of snow removal vary in different localities. The frequency, general direction, and strength of the prevailing winds are important factors. An area in such a position as to be protected from heavy winds or having its main roads parallel with the general direction of the wind may keep the cost of snow removal to the minimum. Areas in open country with main roads running in a direction which makes drifting inevitable may have much heavier costs. Whether snow is wet or dry is another cost factor, dry snow being naturally cheaper to move. Snow falling to a depth of 7 inches without wind can be removed at low cost before it has settled or become packed. After it has settled or become packed and drifted, the cost of snow removal is much greater.

Apparently, however, the communities that have gone in for snow removal consider it well worth the cost. Formerly dwellers along numerous roads were snowed in until the spring thaw. Their paved highways were blocked and made valueless for wheeled traffic. Their motor vehicles had to be stored for the winter and wheeled traffic stopped until April or May. This handicap to business and to social life is believed to be a heavier cost than that represented by the cost of snow removal. With better roads maintained during the snow season, protection from fire is afforded throughout the year. Physicians can make their calls more easily, country merchants can maintain their stocks at a much reduced carrying expense, rural mail delivery and school attendance are facilitated, and farmers are enabled to supply their markets continuously.

The Lighting of Airplane Landing Fields

By Oscar Werner

THE introduction of night flying on a commercial basis created several new problems, particularly those that are concerned with illumination. The aviator flies from one to several thousand feet above the ground in utter darkness and he has to rely for his course on a well-lighted airway, and for his landing on a well-lighted landing field. The lighting of airways is a subject of its own, and here we are more particularly concerned with the lighting of landing fields.

Landing fields are equipped with several types of lighting, depending on the purposes for which they are intended. Taken in the order in which the aviator approaches the landing field, they are:

The revolving beacon, which indicates to the aviator the location of the landing field when he is still a considerable distance away.

The boundary lights, which must clearly show to the aviator the outline of the field as he is approaching it.

The marker lights, which give him the most favorable points of approach.

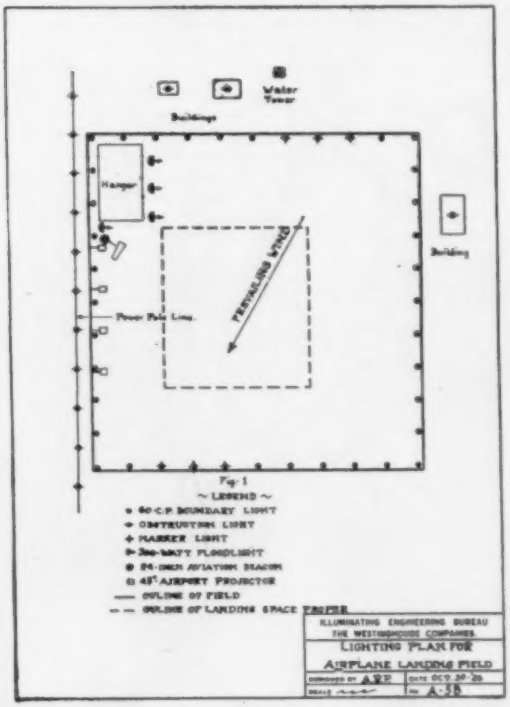


FIG. 1

The light illuminating the wind cone, which indicates to him the prevailing direction of the wind against which he has to land.

The obstruction lights, which warn him of any dangerous obstacles which he has to clear.

The landing field floodlights, which illuminate that portion of the landing field proper on which the aviator makes his landing.

The local lighting used for illuminating his final goal, the hangars and the approach thereto.

It is common practice to use white lights for illumination purposes, green lights for most favorable approach, and red lights for obstacles and danger. The landing field lights with which the airplane itself is equipped, are purposely ignored here, as on account of the nature of their construction, their light weight, and the heavy shocks they are sometimes subjected to in landing, they should be used only as auxiliary or emergency equipment.

Figure 1 is a plan view of a typical landing field showing the position of the various lighting units.

The revolving beacon is essentially a 1,000-watt projector sending out a beam of about 5° spread. The projector is revolved by means of a small electric motor about six times per minute in a horizontal plane, causing the beam to sweep the horizon. The beam is tilted slightly upward so that it strikes the approaching aviator's eye. Figure 2 is a typical beacon of this type. It is identical with the type of beacons which are used on airways and have proved exceedingly satisfactory. The beacon is usually mounted on one of the hangars or in close proximity thereto at a height of approximately 50 feet above ground level.

For boundary lights, vapor-proof fixtures are usually employed. They have upward-pointing lamps protected by heavy glass globes and are water-tight and dust-proof. A heavy wire cage over the glass globe adds further protection. These units are mounted at a distance of about 3 feet above the ground level and are usually spaced at 200-foot intervals all around the field. Figure 3 shows a typical unit of this kind.

The marker lights differ from the boundary lights only in that the globe which covers the lamp is of green glass, thus throwing off a green light. They are used in pairs or in sets of three in place of the boundary lights, to indicate the most favorable approach.

The wind cone lights are provided to clearly outline the wind cone, and advise the aviator of the direction of the wind. They should give a fairly high intensity of illumination. For this purpose the units shown in Figure 4 have proved quite satisfactory.

The obstruction lights differ from the boundary lights only in that the globe is of ruby-colored glass. They should be mounted on all high structures such as water-towers, trees, etc., and high building within the field or in close proximity thereto in order to lessen the danger of collision on the part of the aviator.

The landing field floodlights are a more recent development. They are of the greatest importance, as the safety of aviator and plane is dependent thereon. They must be mounted outside of the landing field proper, and their light must have sufficient penetration to illuminate an area of from 700 to 1,000 feet in width and 1,000 to 1,500 feet in length located toward the center of the fild. They also must be mounted low so as not to interfere with the aviator's leveling off. They must be non-glaring so that, if the aviator has to fly into them because of prevailing wind conditions, he is not blinded by the beam. Their light should be fairly uniform in intensity and not too bright. An aviator coming out of the dark cannot quickly enough adjust his eyes to a bright light, and, in fact, where exceedingly bright lights are used, aviators prefer to land in the darker portion of the illuminated area.

There is another important consideration. An airplane landing field may have been planned for light travel with only one airplane landing at a time and with considerable interval between landings. In a very short space of time, the conditions may change and the traffic may become quite heavy. This greater traffic will need a greater area of illumination. It is important, therefore, that the method of lighting be such that the lighted area can be increased readily and at minimum expense. All these considerations would lead to the use of several smaller units in preference to a large concentrated unit. With several smaller units, the glare, if any, is split up and the illumination is more uniform, because of the fact that with proper spacing the beams in the further distance overlap, as is plainly shown in Figure 5. Furthermore, the lights can be adjusted to follow the strip of ground in front of them, and thus fields that are not entirely level can be readily illuminated by individual adjustment of the units. And if some time after installation it is found that the illumination should be increased either in intensity or in area, it is easy to add to the number of units and space them at shorter intervals. Another important factor is the greater security of operation obtained by the use of several units. If the lamp in one of these units should fail at a critical moment, the other units will still give

FIG. 2

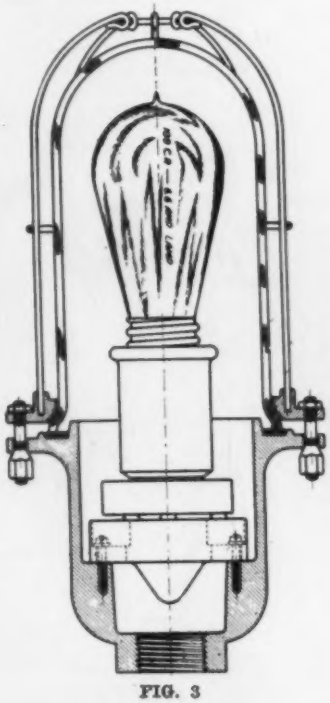


FIG. 3

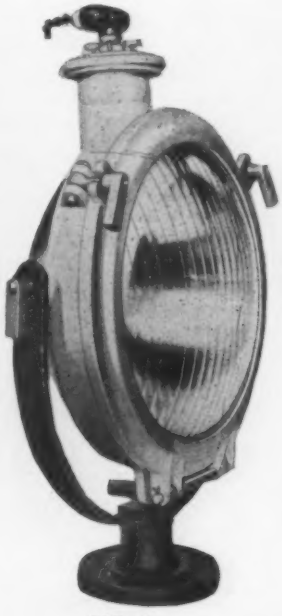


FIG. 8

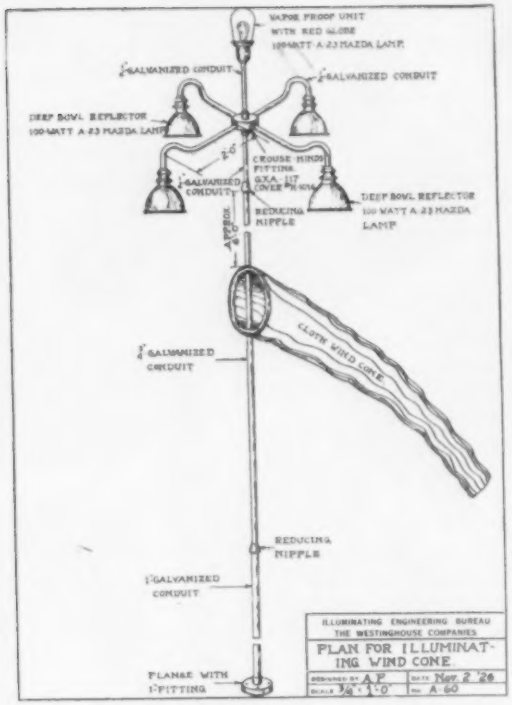


FIG. 4

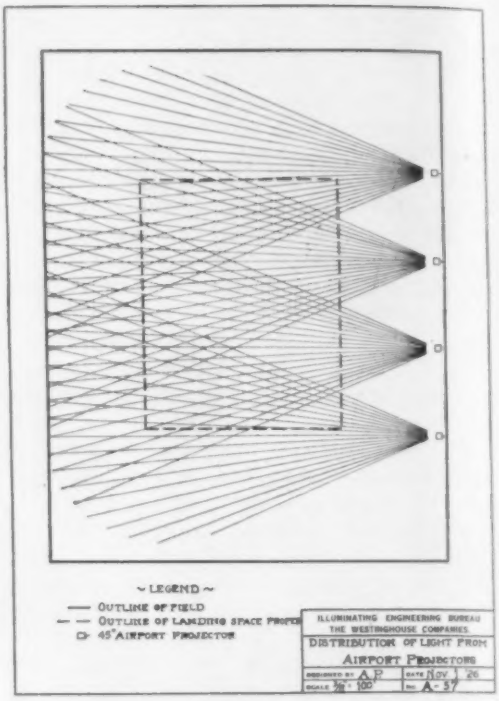


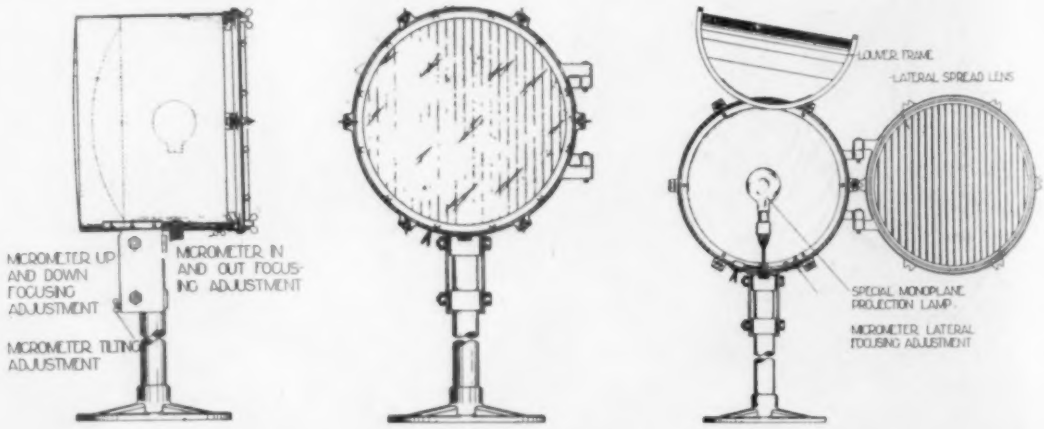
FIG. 5

sufficient light to allow the aviator to make a safe landing.

Figures 6 and 7 show a typical unit of this type, which is characterized by a 24-inch reflector with a long focal distance so as to produce a very concentrated beam. This beam is fanned out by a spread lens which produces a horizontal divergence of about 45°. A system of louvers is provided to intercept all upward-directed rays. Thus, with the unit placed slightly below the height of the average aviator's eyes and tilted forward so that the upper rays are slightly below horizontal, practically no rays will hit the aviator's eyes, and the glare which has proved so objectionable heretofore is practically eliminated. The aviator can safely land against the lights if the direction of the wind forces him to do so. The unit is entirely dust-proof and rain-proof.

Three to six of these lights are usually placed along the center of one of the boundary lines most nearly parallel to the direction of the prevailing wind. They are usually spaced 300 to 350 feet apart, their exact spacing and number depending on local conditions.

The local lighting of the hangars is best


MICROMETER UP AND DOWN FOCUSING ADJUSTMENT
MICROMETER IN AND OUT FOCUSING ADJUSTMENT
MICROMETER TILTING ADJUSTMENT
LOUVER FRAME
LATERAL SPREAD LENS
SPECIAL MONOPLANE PROJECTION LAMP
MICROMETER LATERAL FOCUSING ADJUSTMENT

FIGS. 6 AND 7

accomplished by the industrial reflectors, such as the RLM Dome type, mounted at sufficient height on top of the hangars to illuminate their roofs. Angle reflectors overhanging the edges of the roofs may be used to illuminate the sides of the buildings. Floodlight projectors of from 500 to 1,000-watt capacity are mounted at the front edge of the hangars to illuminate the space immediately in front of them and to facilitate guiding the airplane into the hangar. A typical floodlight of this type is shown in Figure 8.

Industrial lighting fixtures or standard floodlight projectors are also used for the illumination of administration buildings, supply depots and the like.

In isolated locations where power from a central station may not be available, small generating sets similar to those used for farm lighting are employed to supply the necessary electric current.

The above-described methods may be said to cover the latest practice in the lighting of airplane landing fields. They are the outcome of several years of costly experimenting and they all have been adopted as standard practice by the U. S. Army Air Service. With slight modifications they are applicable to any landing field, irrespective of size, outline, or contour.

"The Spider Does It Better"

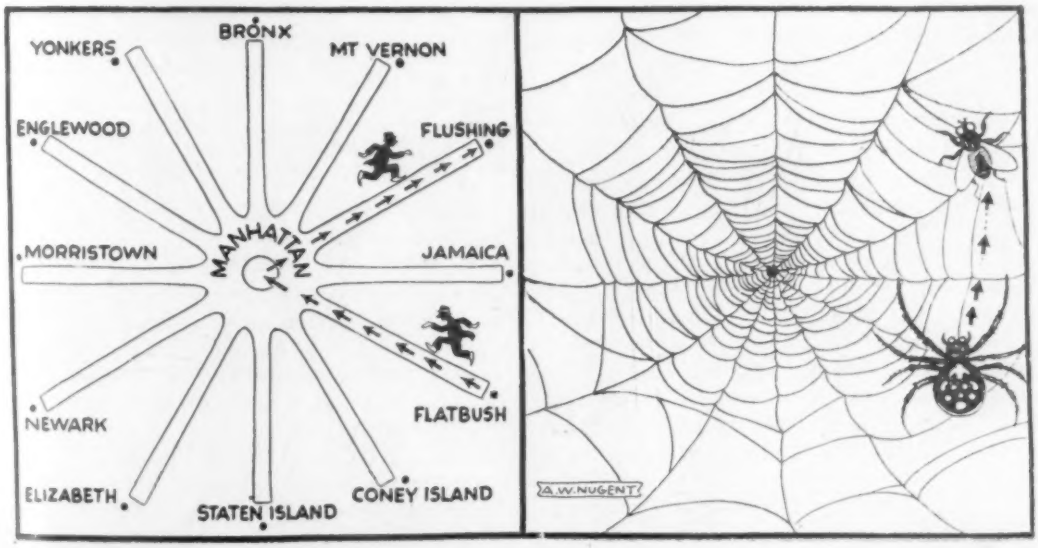
A VIGOROUS protest against the proposed attempt to solve New York City's transit difficulties by the construction of a new independent subway line is voiced by the City Club of New York in a letetr to the Board of Estimate and Apportionment. Excerpts from this letter appeared in a recent issue of the City Club's *Bulletin*, with the accompanying cartoon illustrating the truth of the contention that in the matter of transit systems "the spider does it better."

That new subways are needed, is admitted, but the City Club protests that they should be built as parts of and additions to our present city-owned subway system. The rapid transit facilities of New York have been built in the form of a wheel without a rim, with the thickly congested hub in lower Manhattan and with the spokes radiating from there out to the Bronx, Queens, and Brooklyn, but with never a crosstown or belt line connecting these boroughs directly together and thus avoiding the present necessity of going through Manhattan to get from any one of the three to any other of the three. We go from the outward end of a spoke left there in mid-air, down the spoke into the hub, and then out another spoke to another end, and so are left in another place in mid-air.

The plan of the third subway superimposes upon the city a third wheel of subways without a rim. Its center is in the same old hub of lower Manhattan, and all its spokes will be in and out of that hub, barring only a single suggested crosstown line between Brooklyn and Queens, which is, however, only an idea thus far and not yet a part of the adopted plan of this third subway system.

The City Club's recommendation is that New York's system approximate the plan of the cobweb. "The spider is a successful business animal who builds his cobweb with numerous cross-strands as well as spokes—with ever so many belt lines, big and little—and the spider is thereby enabled to use his own rapid transit layout with definite and prosperous effect. He gets there—cross-lots. And he seldom misses. We human being miss, every day of our lives."

EDITORIAL NOTE.—The letter of the City Club to the Board of Estimate and Apportionment has been published in full in a pamphlet entitled "Subways or Children? Which or Both?" obtainable from the City Club of New York, 55 West 44th Street, New York City.



Making Civic Service Fashionable

Methods of Stimulating Voluntary Public Service of Private Citizens—Civic Awards by Marquette University

By Dr. Edward A. Fitzpatrick

Dean of the Graduate School, Marquette University, Milwaukee, Wis.

IN our effort to build cities we have failed generally to tap what is perhaps one of the greatest of civic resources—voluntary public service of private citizens. We are concerned so much with government—when we *are* concerned with it—that we forget ourselves in our private capacity. We must keep our eye on the individual citizen, both because it is for him the city exists and it is through him it must gain its redemption. The individual citizen cannot, if the city is to become great, nonchalantly leave to government the responsbility of the community life. Methods of social stimulation and social approval of voluntary individual effort must be developed. Democracy cannot leave these things to chance. Monarchies did not do so. While social parasites were frequently maintained, monarchies have been keenly interested in the great civic, intellectual, and social services rendered by so-called private individuals. They have developed a technique of utilizing this ability, enlisting it, sometimes rewarding it substantially, and particularly, for our immediate purpose, of expressing social appreciation and social approval of it.

We seem to have a faint sense of the usefulness of these services from this great civic and social reservoir of the individual's private effort. We have begun to enlist it together with the services of the public servant who goes beyond the routine demands of his position and renders on his own initiative a great constructive social service. If the office would not confer honor on Diogenes, Diogenes would confer honor on it.

The evidence of this effort to enlist the voluntary public service of private individuals and what might be called the surplus service of public servants is found in various sections of the country. Through the generosity of Edward Bok, an annual award of a $10,000 prize is made in Philadelphia to the citizen of Philadelphia who has merited it in the judgment of the board of directors. It has been given to Dr. Leopold Stokowski, the composer, leader of the Philadelphia Orchestra and noted musician; second, Dr. Russell H. Conwell, educator and minister of the Gospel; third, Samuel S. Fleisher, philanthropist; and, fourth, Dr. Charles Custis Harrison, late Provost of the University of Pennsylvania.

The Rotary Club of Houston, Texas, awards a gold medal to the citizen of Houston whose unselfish endeavors during any one year are of greatest value to the city. The Rotary Club of Jackson, Mich., also gives an award annually for the most meritorious public service outside the line of duty. The award in 1924 went to the principal of a school, and in 1925 to the head of the Land Titles Department of the Consumers Power Company. The local chamber of commerce or board of trade has also attempted to discover and reward this kind of service in Denver, in Cleveland, and in Washington, D. C.

Cities have formally sought to bestow such recognition. Especially noteworthy in this connection is the colonnade of civic benefactors established in Denver. In 1920 Mayor Bailey of Denver appointed a Civic Benefactors Commission to carry out the plan of former Mayor Speer of Denver to stimulate the bestowal of substantial gifts upon the city to increase its beauty or distinction. The Commission selected the names of thirty citizens who had in the past added beauty and distinction to the city, and has added several others since. The inscription on the colonnade perhaps is sufficient indication of its purpose:

"IN ORDER TO GIVE EFFECT TO THE OFT EXPRESSED INTENTION OF THE LATE MAYOR ROBERT W. SPEER, THE GOVERNMENT OF THE CITY AND COUNTY OF DENVER, COLORADO, HERE RECORDS WITH GRATEFUL APPRECIATION THE NAMES OF CIVIC BENEFACTORS WHO BY GIFTS OF MATERIAL CHARACTER HAVE ADDED TO THE BEAUTY AND DISTINCTION OF THIS CITY."

Another specially significant program is the provision by the City Council of Sacramento of an Honor Roll and Memorial Gift Commission whose duty it is to prepare a list "to collect full and complete information on all public gifts, donations, legacies, and bequests, of whatever nature, from the city's earliest history to date, and to arrange for the appropriate memorialization of the names of the donors and their gifts." The other function of this Commission will be to stimulate others to emulate the examples of these givers of good gifts, or at least, large gifts.

Marquette University, of Milwaukee, independently of these other efforts, established in 1924 the award of a Certificate of Distinctive Civic Service. The award is made annually at a Civic Convocation of the University held in the evening, to which the public is invited. The award by a university has advantages in social prestige and approval which some of the other methods already indicated have not, and the fact that the university does not have any special interest except the largest possible service to the city, to which it is dedicated, is likely to make its awards more disinterested and consequently more generally approved. The problem noted in the others has presented itself to the University authorities, namely, what shall be the basis of the award. And the solution seems to be in not defining in advance any particular kind of service exclusively entitled to award. The awards at Marquette University are made on the basis of very specific citation of the record of the individual, which is printed in the public program of the occasion and extensively in the newspapers, and is made a part of the permanent records of the University. The nature of these awards up to date is indicated in the following list of the awards:

CHARLES F. PFISTER:
For quiet and unostentatious charity, both palliative and constructive, to many and diverse causes affecting the education and social welfare of the large numbers of human beings, and for lifelong civic interest in Milwaukee.

MRS. JOHN W. MARINER:
For outstanding and unselfish service and leadership in patriotic activities, particularly during the war time, for effective work in women's clubs, state and local, and for special interest in hospital care of children.

NAT STONE:
For willing service in all general social and educational movements affecting the community welfare and particularly for his leading part in every movement among the Jewish people of our city for their religious and social welfare.

MRS. JAMES H. HACKETT:
For effective personal work and stimulating leadership in the interest of the aged and the delinquent, for active participation and wise guidance in the local and national association of Catholic women for general social welfare, and for ready and willing service to the Community Fund and to all social agencies.

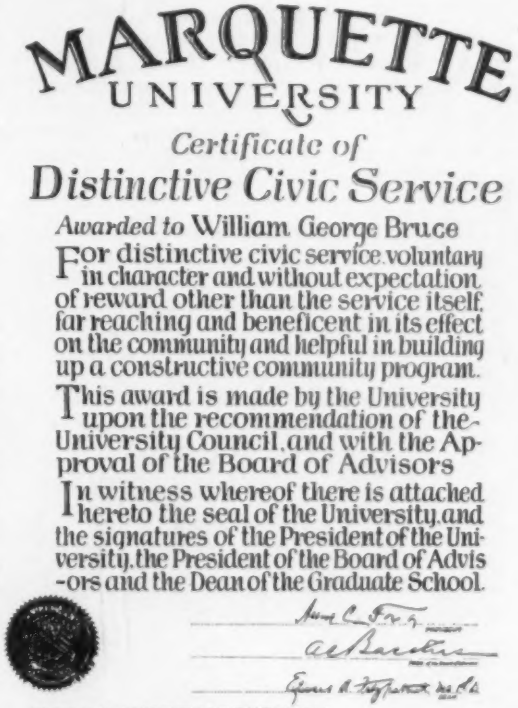
WILLIAM GEORGE BRUCE:
For continuous and energetic activity in the development of Milwaukee harbor from unpromising beginnings to what now seems like splendid fruition; for fine devotion and unstinted service in the cause of Catholic charity and practical religion, for a lifelong devotion to every civic interest in Milwaukee, personally and as an officer of commercial and civic organizations, and for rendering to education everywhere in this country a fine constructive service through the School Board Journal.

MR. AND MRS. H. H. JACOBS:
For joint and individual service in the organization and direction of the Wisconsin Anti-Tuberculosis Association and for national service in this field, for the organization and direction of the University Settlement, for leadership in the State Conference of Social Work, the Central Council of Social Agencies and the Family Welfare Association, for assistance and guidance in the beginning and in the development of practically every social welfare movement during the last twenty-five years, particularly in the fields of tuberculosis, child health and betterment and industrial health and welfare.

CHARLES AARONS:
For disinterested and highly efficient service as a member of the School Board and the Library Board, for active personal interest in civic movements, and as a lawyer of exemplary professional character, and for the auspicious beginnings of a judicial career in which the administration of the law is controlled by high conceptions of personal responsibility, social justice and human welfare.

SISTER MARY PANCRATIA, B. V. M..
For consecrated and devoted service as a classroom teacher for forty-four years, for following up her boys for years after graduation, always interested in their success and by personal guidance and wise admonitions keeping them in the way they should go, and for exemplifying in a high degree the ideals of consecration, utter self-sacrifice, and kindly and personal interest in the welfare of fellow human beings which is the way of the Great Teacher.

Surely these various people furnish a wide basis for a definition of public service. But who would want to limit the nature of services even to these particular kinds of services? Shall we not, for example, give an award when the proper person is discovered, to a mother of five sons or daughters, all of whom are rendering efficient service to the city? The purpose of such awards ought to be to discover the service that is not spectacular or heroic in its setting, but is in its quality. I saw a description the other day of a nurse who would certainly receive a certificate of


MARQUETTE
UNIVERSITY
Certificate of
Distinctive Civic Service
Awarded to William George Bruce
For distinctive civic service voluntary in character and without expectation of reward other than the service itself, far reaching and beneficent in its effect on the community and helpful in building up a constructive community program.
This award is made by the University upon the recommendation of the University Council, and with the Approval of the Board of Advisors
In witness whereof there is attached hereto the seal of the University and the signatures of the President of the University, the President of the Board of Advis-ors and the Dean of the Graduate School.
MILWAUKEE, WISCONSIN.

FORM OF CERTIFICATE FOR DISTINCTIVE CIVIC SERVICE USED BY MARQUETTE UNIVERSITY

distinctive civic service if we found her in Milwaukee. This is the story:

"A private nurse was called into an isolated Illinois farmhouse in the dead of winter to a scarlet fever case. The child patient was apparently dying of exhaustion because she could not sleep. The mucous membrane of nose and throat had become so badly swollen that whenever she fell asleep, the dried tongue stopped the child's breathing and she woke again.

"The nurse, watching the child, discovered the difficulty. Wrapped in a blanket, in an unheated bedroom in zero weather, she sat all night long at the bedside with a glass of water and a medicine dropper, letting fall drop after drop of water upon the child's swollen tongue, so that the child slept peacefully all night through. That was more than kindness or sympathy. It called for endurance, but it also called for insight into what was wrong, and ingenuity as to the remedy."

The newspapers have been generous in their treatment of the awards, and have helped very much to center public interest in the event. This adds the element of social prestige and approval.

This experimentation in making civic service fashionable and worth-while is one of the hopeful signs of a better community life in America. It helps to concentrate the interest of newspapers and public on the constructive side of city life instead of its pathology. It looks upon the city as a fitting environment for the good life. It looks toward an ideal not of a Big City, but a Better City—even a Best City. A city set upon a hill cannot be hid. It may be verily a beginning of a civic renaissance—the polar opposite of the "shame of the cities."

H. G. Wells and Cyrus McCormick, Jr., as Prophets of Motor-Truck Transport

SPEAKING before the Third World Motor Transport Congress, at the Hotel Roosevelt, New York, on January 10, Cyrus McCormick, Jr., Vice-President of the International Harvester Company, quoted a remarkable prediction of H. G. Wells and followed it with some predictions of his own. Said Mr. McCormick in part:

"Seeking a background for this glimpse into the future, I chanced recently upon what seemed to me a most remarkable forecast dealing with locomotion in the twentieth century—a prophecy so bold and far-flung and so far justified by present events that it seems worth repeating here.

"This prediction is from the pen of that gifted philosopher, historian, and novelist, Herbert George Wells. Please remember, as you listen to it, that the book in which it is contained was published nearly twenty-five years ago, in February, 1902. Remember, too, that then the United States had a total motor-car registration of only 23,000 and that motor trucks did not make their appearance in the statistics of our industry until 1904.

"Having assumed that a light, powerful, comparatively noiseless, and smooth-running engine for highway traffic would be devised, Mr. Wells, the prophet, speculated a quarter of a century ago on what direction the development of the new motor vehicles was likely to take, how they would react upon the railways and where, finally, they would take humanity. Answering these questions, he wrote:

"'At present they seem to promise developments upon three distinct and definite lines.

"'There will, first of all, be the motor truck for heavy traffic. Already such trucks are in evidence distributing goods and parcels of various sorts. And sooner or later, no doubt, the numerous advantages of such an arrangement will lead to the organization of large carrier companies, using such motor trucks to carry goods in bulk or parcels on the highroads.

"'In the next place, and parallel with the motor truck, there will develop the hired or privately owned motor carriage. This, for all except the longest journeys, will add a fine sense of personal independence to all the small conveniences of first-class railway travel. It will be capable of a day's journey of three hundred miles or more, long before the developments to be presently foreshadowed arrive. One will change nothing—unless it is the driver—from stage to stage. One will be free to dine where one chooses, hurry when one chooses, travel asleep or awake, stop and pick flowers, turn over in bed of a morning and tell the carriage to wait—unless, which is highly probable, one sleeps aboard.

"'And, thirdly, there will be the motor omnibus companies and the suburban lines. All this seems fairly safe prophesying.'

"The accuracy of Mr. Wells' forecast is no less remarkable because in 1927, twenty-five years later, I am asked to discuss whether or not the motor vehicle is vital. Vital? Listen! There are in this country alone more than twenty-one million motor cars, busses, and trucks, the combined carrying capacity of which is greater than that of all the railways. The motor vehicles in this country and the highways on which they operate represent an investment of twenty-five billion dollars, more than the total investment in railways and equipment. If these factors alone do not constitute vitality, then is the youth and vigor of our country a tragic myth. It is rather a question of how vital motor vehicles are, what part they are to play in the future, what contribution they can make to the improvement of our national life."

After touching briefly on the importance of the motor car and the motor bus, Mr. McCormick pointed out the fact that the haulage of man himself is far less important to human

progress and civilization than the haulage of those things whereby he lives. Emphasizing the increasingly important place of the motor truck in short-haul transportation of freight, the speaker said:

"As the freight car renders a more ideal service than the Pullman, it is to the motor truck that we must turn to discover the most immediate and important use that existing common carriers can make of the motor vehicle.

"If you were a merchant in London and wished to ship to a customer in Liverpool, there would appear before your door the huge lorry of the railway company, and your work would be over once you had placed the shipment on your loading dock. Another railway truck in Liverpool would deliver the package to your customer. Great Britain and other European countries were enjoying the benefits of store-door delivery long before the motor truck was ever heard of. Fortunately, it seems as if the railways in the United States were awakening to the trade-getting benefits of this kind of service, for two roads entering New York have made contracts with a large trucking corporation to deliver and receive freight at the corporation's five warehouses in Manhattan. The former shocking congestion at the pier terminals is divided among the five more centrally located shipping or receiving points; and if the consignee desires to pay an added fee, the shipment may be delivered directly to its ultimate destination. In Cincinnati the railroads have saved much time and capital investment in additional individual terminal facilities by organizing an interchangeable container operation, with large motor trucks conveying the containers back and forth between the stations. In St. Louis, tractors and trailers are used to distribute freight to conveniently located warehouses, and the railways enjoy the benefit of having their lines extended virtually into the heart of the city.

"Of even greater eventual importance with this motor-truck development of terminal facilities is the growing substitution of the truck for local trains carrying package freight. At least ten railroads are shipping goods in unbroken cars to a zone station. Motor trucks are then used to carry the l.c.l. freight to intervening stations at which the heavy freight train used to stop to discharge even a single small package. When the railways go a step farther and find that the same motor truck can pick up freight in the city, transport it, and actually deliver it to the village, they will be approximating the service that is now being given facilities by organizing an interchangeable container by independent trucking companies. . . . I asked a merchant in our suburb why he used the truck company instead of the long-established railway. He replied, "Because it doesn't cost any more, sometimes less—and because the service is so much better and quicker. I call up the wholesaler in the morning and I have my things before night instead of next week." The motor truck is useful, and it will therefore be used.

"It benefits the railways not at all to protest against this sort of thing. For certain work the motor truck is more flexible, quicker, even cheaper, than the railroad and it gives better service. This service the public wants and this service it will insist on getting. In my opinion the public does not care whether it is served by the railway or the independent motor-truck operator, although, all things being equal, it would probably lean to the established business. But if the railways content themselves with protests to the Interstate Commerce Commission and try to get on without the motor truck, they will hurt no one but themselves. We are living in a very modern, very rapid world. Old ways, old mechanisms are useful only as long as they are productive; and now the motor vehicle, a new and very useful article, has come to claim its place in the sun of public approval. The railways will have to learn to use the motor truck."

Correspondence Courses in Municipal Administration

PERSONS wishing to enter the public service or civic work who need a knowledge of the general problems and practices of municipal administration, and those already in the public service who desire to extend their knowledge and improve their technique in a particular branch of work, can now obtain such instruction through extension courses announced by the School of Citizenship and Public Affairs of Syracuse University:

	Subjects	Number of Lessons
1.	Municipal Finance and Taxation Administration	10
2.	Municipal Budget Making	5
3.	Administrative Control of Auditing, Reporting, and Cost Accounting	7
4.	Centralized Purchasing	6
5.	Appraisal and Assessment of Property for Taxation	11
6.	Debt Administration	5
7.	Municipal Corporation	10
8.	Municipal Health Administration	18
9.	City Planning and Zoning	15
10.	Operation and Regulation of Municipal Utilities	10
11.	Personnel Administration	6
12.	Police Administration	12
13.	Fire Administration	9
14.	Public Reports and Graphic Statistics	10
15.	Engineering and Public Works Administration	20

Each lesson involves assigned readings and questions based on such readings. The aim has been to arrange lessons which will require about two hours for preparation, thus making it possible to handle the courses entirely by correspondence without seriously interfering with scheduled work. As soon as one lesson is completed, the replies are to be forwarded for review and correction to the School. They are then returned to the student with appropriate corrections and suggestions.

Great care has been exercised in the selection of the tests to be used in the courses. Books and pamphlets by recognized authorities have been chosen which cover the various subjects in a practical yet comprehensive manner. In nearly all cases the material is of very recent publication. It is the purpose of the School to revise the assignment of texts whenever necessary in order that the courses may be kept abreast with every forward development in each of the fields of municipal administration.

A bulletin giving additional information and outlining the courses in some detail will be sent to any reader of THE AMERICAN CITY on application to William E. Mosher, Managing Director, School of Citizenship and Public Affairs, Syracuse University, Syracuse, N. Y.

The History of Street Cleaning in Paris

PART II

Prepared from a Translation Made by Adeline D. Lovett for the Bureau of Street Cleaning, Philadelphia; A. M. Soby, Chief; J. H. Nuttall, Principal Assistant Engineer

By L. Girard

Assistant General Inspector of the Public Works of Paris

In the Seventeenth Century—Sprinkling

BY the seventeenth century the hygienic equipment of Paris had been provided with cesspools, cared for by the proprietors. Street-cleaning contractors had only to collect the mud and filth arising from the sweeping of the streets, to which the people added as much rubbish as possible from indoors.

Street-cleaning organization had already been developed. In 1638 the contractor's work was supervised by a citizen in each street. If the work was satisfactory, the citizen would give the contractor a copper coin which enabled him to draw his pay from the city treasury. Each of the sixteen districts had its own particular despository. Paris had become sufficiently clean for the people to travel on foot —with boots.

The city was beautiful. It had 10 kilometres of sewers. It even had promenades, notably the Queen's Walk, which, beginning with 1649, was watered during the summer by hand, with buckets. At the accession of Louis XIV the condition of the roads was such that the surface could be drained off without great difficulty, with the result that an act of Parliament forbade the people to keep in their houses any stagnant or foul water and ordered them to throw in into the street and immediately to throw on it one or two buckets of clear water.

The King busied himself with improving the general health of the capital. An edict of March, 1667, assigned the duties of Lieutenant of Police to a magistrate who reported to the Council of State. This officer had sewers dug, forced the people to pave the street in front of their houses, as they had been vainly ordered to do since 1388, and managed the depositories. An edict of 1674 separated the depositories for dirt and rubbish from those for the filth from cesspools.

A SCENE IN THE GARDEN OF THE TUILERIES IN 1750, SHOWING THE BARREL SPRINKLER BEING DRAWN BY HAND

In the Eighteenth Century

But the collection of the tax was not satisfactory, so, in 1704, Louis XIV ordered it replaced by a tax assessed in combination with the general city taxes. During the eighteenth century refuse collection was done by contract, with two-horse carts, each with a driver and a helper. The contractor had to furnish the depository. He knew the value of the filth and refuse as manure, the selling of which to individual proprietors was forbidden by a law of 1703.

The details of street-cleaning organization were becoming definite. Contractors were allowed to offer bids to the different sections of the city. Special contracts were awarded for snow and ice removal. The cleaning of markets was by special arrangement, each merchant sharing in the expense of the market sweeper.

Very few contractors seem to have made a fortune. It is told, however, how Peter Outrequin was appointed contractor of street cleaning for all Paris and succeeded in monopolizing most of the public works, especially the repairing of paving. He bordered the boulevards of the Midi with four rows of trees, and he made a sensation with his barrel sprinkler.

The first sprinkler of this kind had appeared in 1750. It was a heavy wooden container drawn by four men, and was used to sprinkle the walks of the Tuileries, much to the admiration of everybody. Peter Outrequin extended its use to the highways. His reputation was then at its height, and the King conferred upon him the order of Saint Michel and made him a noble in 1761.

PARIS AWAKENING, SHOWING THE CITIZENS CLEANING THEIR STREETS AND SIDEWALKS

In 1782 the collection service employed 120 carts, each of which made five trips a day. Refuse was removed daily only in the most frequented streets. In the others it was done at intervals varying from two days to a month. At this time all the obligations of the citizens were carefully defined. The inhabitants were compelled "to have the streets in front of their houses swept to the middle of the road every day before the passing of the carts; to remove the snow and break up the ice on the public streets; to set aside, in baskets, broken pottery, bottles, glass, old iron, etc., which must not be mixed with the refuse; and during the hot weather, twice a day, at 10 and 3 o'clock, to sprinkle a space two feet in front of their houses."

They were forbidden to throw into the streets refuse and trash from their gardens, or snow and ice from the sidewalks. Fines of 100 to 300 livres were imposed. Even imprisonment was inflicted upon those who gave bribes to the carters to get them to take forbidden material in their carts.

After the Revolution the State had nothing to do with the police expenses of Paris—cleaning, lighting, etc.—which were taken care of by the municipality. The transporting of dirt and refuse then became a municipal duty, the payment for which was combined with the other taxes.

In the Nineteenth Century

The nineteenth century brought about rapid progress in the management of the public streets. After 1824, the sidewalk, an English importation, was extended to all the streets. The roads with central gutters gave place to roads with side gutters. The subterranean sewer system was enlarged, reducing the surface water to a minimum. Water conduits were placed everywhere. The streets were made so much wider that the citizen's duty of sweeping half the road in front of the house seemed too heavy and was limited to a zone of 6 metres from the front of the house. The city maintained the sweeping of the squares, the public gardens, and the middle of streets of more than 12 metres width.

The paving improved. Macadam, less noisy than stone, was used in Paris from the middle of the eighteenth century. Asphalt, which appeared in 1837, was commonly used after 1855. Wooden paving did not come until much later. Tried tentatively about 1870, it was not in common use until 1881.

As sweeping continued in large part to be a duty of the citizens, its supervision remained a police duty. That is why, when the law of January, 1793, gave the administration of Paris to the two Prefects, the cleaning and lighting remained duties of the Prefect of Police.

The mixed system was still practiced. Before the passing of the cart, the inhabitants had to sweep in front of their houses, piling the dirt in heaps. The Prefecture of Police took charge of the removal in carts, which was done by contractors. In 1829 there was one contractor, and he had only one storage place for equipment. The workers were paid 18 cents a day for 7 hours' work—from 4 to 11 A. M.

The people were allowed one hour each day —from 6 to 7 in summer and from 7 to 8 in winter—to sweep the zone of 6 metres left in their charge. They continued to evade their

duty, and epidemics—now called cholera—still occurred. To overcome this evil, the police ordinance of December 5, 1846, arranged for the organization of private companies which, for an annual sum, took charge of the sweeping for the people. They allowed the workers to sweep outside of the regular hours—after the passing of the cart.

Immediately, abuses appeared; piles of rubbish remained all day on the streets and were added to by the people. In 1853 the Prefect of Police had to withdraw the privilege accorded to the companies, of sweeping after the passing of the cart, and most of the companies were obliged to give up the work. The municipal administration took their place, and created subscriptions for optional street cleaning. Therefore, up to 1873 there were three organizations working side by side on one street—the municipal administration, the companies, and the people who preferred to sweep, themselves. It is easy to imagine the complexity of the system.

Sprinkling continued to be done only by the citizens, except in the principal streets, where the city used its barrel sprinklers.

But the demands of the public increased. The citizens did the sweeping only in the mornings. Public opinion demanded complementary sweepings during the day, therefore the administration had to employ special workers. Street cleaning ceased for the most part to be done by the citizens and became the duty of the municipal service. That is why it was withdrawn from the control of the Prefecture of Police by decree of October 10, 1859, and was entrusted to the Paving Engineers, who were dependent on the Prefecture of the Seine.

Progress became more rapid, thanks to improvement of equipment. The machine sweeper with the roller-broom was made practical by Sohy in 1876. Paris had 40 of these in 1873.

The development of the system of water conduits permitted the beginning of free sprinkling, inaugurated first in the Bois de Boulogne and de Vincennes and extended after 1859 to all the principal streets. At the same time, the heavy wooden barrel drawn on a horse-cart, led by a carter, was replaced by a metal cask, the driver of which managed the sprinkler from the driver's seat.

However, the refuse deposits remained on the streets. The streets were clean only where the administration cleaned them. Under the pressure of public opinion, the city of Paris demanded that the duty of sweeping be converted into an obligatory municipal tax, levied on all proprietors and representing the cost of sweeping. Thus decided the law of March 26, 1873, and since then the duty of sweeping the streets of Paris, has rested entirely on the municipality.

Finally, Prefect Poubelle, in 1884, gave an order which was fairly well observed, imposing on proprietors the duty of providing receptacles for refuse. The protests of the people were limited to naming the receptacle after the Prefect, but the Prefects' victory was only partial. The people consented to the receptacle, but forty years later they still object to providing it with a cover. Likewise, they have never used separate receptacles for broken glass, pottery, etc.

Since that time street cleaning in Paris has been only a problem of perfection of detail. Since 1880 salt has been used to melt ice on the streets. Smooth pavements—asphalt, bitumen, wood—have led to the creation of a new operation—using rubber-plated tools to scrape and dry the streets after they have been washed Macadam is being replaced by asphalt and wood. Water is used freely for washing the streets. The equipment for collection of refuse is being improved; more and more mechanical devices are being used. In such matters the models resulting from the studies made in Paris are the most perfect yet made [in Europe.—Ed.].

Finally, a way has been found to utilize the household refuse that the farmers in the suburbs cannot use as fertilizer. It is transported to a distance by railroad and is ground to make better fertilizer. Since 1899 there has been a plant for grinding refuse at Saint-Ouen. Incineration, studied since 1893, was put into operation soon after 1900.

The period of groping is over, and one of industrial development is in progress. While pursuing methods whose value is no longer in doubt, the municipality is striving for improvements.

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EXTERIOR OF SEWAGE SCREENING PLANT AT JAMAICA, L. I.

The Jamaica Sewage Disposal Plant

The Second Largest Sewage Screening Plant in the World

THE Jamaica plant, largest sewage treatment plant in New York City, was recently completed and officially opened. It ranks as the largest screen filter plant in the United States, and the second largest in the world. This plant is located in South Ozone Park, Jamaica, in the borough of Queens, and is the first of three units to be installed for treating the sewage of an area of about 24,000 acres.

The magnitude of the sewage disposal problem—designing a system for the borough of Queens—can be visualized when the total area of the borough of Manhattan, New York City, 14,000 acres, is compared with 24,000 acres, or but one-third the area of the borough of Queens, in which the plant is located and which is under immediate improvement. Parts of this section have been designed under the separate system of sewers and other portions under the combined system. All the plans and specifications, etc., were prepared by the Bureau of Sewers of the Borough of Queens, under the supervision of Frederick Seely, Engineers of Design, and Arthur S. Tuttle, Chief Engineer of the Board of Estimate and Apportionment of New York City, and under the jurisdiction of Borough President Maurice E. Connolly.

The treatment plant is so designed that it may be considered as one unit of three which will make up a plant of 240 million gallons per day. The ultimate process of treatment of the sewage will depend upon the sanitary requirements and the development of the art of sewage disposal. The present unit consists of detritus grit chambers, two Sanitation disc screen filters, pumping equipment, motors, heating plant, and all equipment necessary for the operation of the plant, with chlorination of the effluent. The effluent is discharged through a wood stave pipe into Bergen Creek and Jamaica Bay. Pollution of the bay will immediately be considerably relieved with this plant in operation.

The sewage treatment and pumping-station is built in an 82-foot concrete circular caisson, with 6-foot walls to a depth of 54 feet below the surface of the ground. The structure was built as an open-ended cylinder and sunk by excavating within its walls. The weight of the concrete caused some sinking or settlement, but the greater part of the sinking was accomplished by dredging. A total of 2,000 cubic yards of concrete was poured in the walls, and 10,000 cubic yards of excavation was required to permit the tank or caisson to sink to its proper depth. The bottom is of solid concrete, containing 1,600 cubic yards, and shaped like a saucer, 16 feet thick at the center and 7 feet thick at the edge where the bottom and sidewalls join. The concrete was placed by the tremie method under the full head of water, which was later pumped out.

The superstructure on top of the caisson consists of a brick building 12 feet in height, 57 feet 2 inches square, supported on 52-inch steel girders. It is of artistic design of white granite trim and bronze doors. The partitions are of hollow tile and provide for an office, transformer room, chlorine room and toilet.

The sewage comes to the plant in one 96-inch sewer and two 18-inch auxiliary sewers,

and before reaching the screen chamber passes through a four-alley grit chamber for the removal from the sewage of coarse, heavy solids, such as logs, ashes, sand, etc. The grit chamber is 40 feet wide by 96 feet long and 33 feet deep, with reinforced walls 24 inches thick. It is equipped with traveling crane with clam-shell bucket and conveyors which are used for removing the grit.

In front of the grit chamber is a bar screen and ahead of this an adjustable wedge main gate which controls the flow of sewage to the treatment works and safeguards the entire plant. This gate is 8 feet square. At the head of each of the four alleys of the grit chamber is a manually operated gate measuring 4 x 6 feet, and at the end of each is a 4 x 6-foot gate electrically controlled from the main switchboard in the screening and pumping station. These gates are all of the Sanitation-Geiger type. They are cast iron with bronze seating rings, bronze roller guides, and adjustable roller wedges. By the arrangement of gates in the grit chamber as described, one or more alleys may be shut down or taken out of service for cleaning or repair as desired.

A main influent gate, 6 feet square, of the Sanitation-Geiger type, controls the flow of all sewage into the screening and pumping station from the grit chamber. It is fitted with bronze roller guides and adjustable roller wedges, and is electrically controlled from the main switchboard on the balcony of the screen room.

Screens

From the main influent chamber there are two outlets leading to two Sanitation disc screen filters. These outlets each contain a 4 x 6-foot influent sluice-gate of the same type as the main influent gate, except that it is hand-operated. By this construction all the sewage may be diverted to but one screen filter while the other is shut down or out of service, or both may be operated at the same time. The effluent passages from each screen contain a 4-foot square weir type gate, of the same construction, design, and operation as the influent screen gates.

The two disc screen filters are each 26 feet in diameter and of such relative capacity as to insure the screening of the full flow of sewage coming to the station at a low velocity. The screen plates or sections that make up a screen are constructed of monel metal strips 3/16-inch wide, set on edge and curved so that the brushes passing over the revolving disc screen travel in the direction of the slots or openings and not across them. The strips are 1/32-inch thick and spaced 3/32-inch apart, giving a maximum of open area for filtering. Deducting for supporting rods, etc., in each plate, the open area is 69 per cent of the total area of the screen.

In addition to the switchboard control, each screen is controlled by a push-button near the screen motor on the operating bridge over each disc screen filter. The screens are further automatically controlled by float switches operating in the influent channel before the screens, and so arranged as to start the screen at a high-water mark and stop the screen when the flow of sewage reaches a predetermined low level. These float switches are so arranged and connected that they may be cut in and out of service as desired. Each screen is equipped with a special loss-of-head gage so that the loss of head through the screen may be read directly. The screens are further equipped with a water- and oil-spraying system for cleaning the surface and slots of the screens. The brushes that travel over the curved slots are also equipped with a cleaning device, to remove any grease, or scum.

Pumps

The pump room contains four main pumps with a total capacity of 121,000,000 gallons, and two sump pumps for removing all station drainage, possible leakage, etc. The main pumps consist of three 30-inch units and one 24-inch unit, of 31-m.g.d. and 22-m.g.d. capacity respectively. These pumps are all horizontal, single-suction, mixed-flow type, with internal hydraulic automatically controlled check and regulating valves of the cone type. The pump cases, valves, and impellers are of cast iron; the shafts are protected with bronze sleeves, and the cases, impellers, and valves are provided with bronze wearing and seal rings.

The 30-inch pumps are driven by 300-h.p. motors and the 24-inch pump by a 250-h.p. motor, all connected direct through flexible couplings. All motors are operated by automatic float switches, similar to the float switches used in the screen influent channels, so that the pumps cut in and out of service according to the rise and fall of the filtered sewage, one or more pumps operating, depending on the height of the liquid. The pumps may be operated either automatically or manually by means of push-button stations located at the pump and also on the main switchboard.

The sump pumps for all waste and drainage water that drains to the lowest level in the station are 4-inch, single-suction volute, each driven by a 7½-h.p. motor through a vertical shaft and centrifugal friction coupling. These pumps are operated by push-button stations, one located on the main switchboard and another

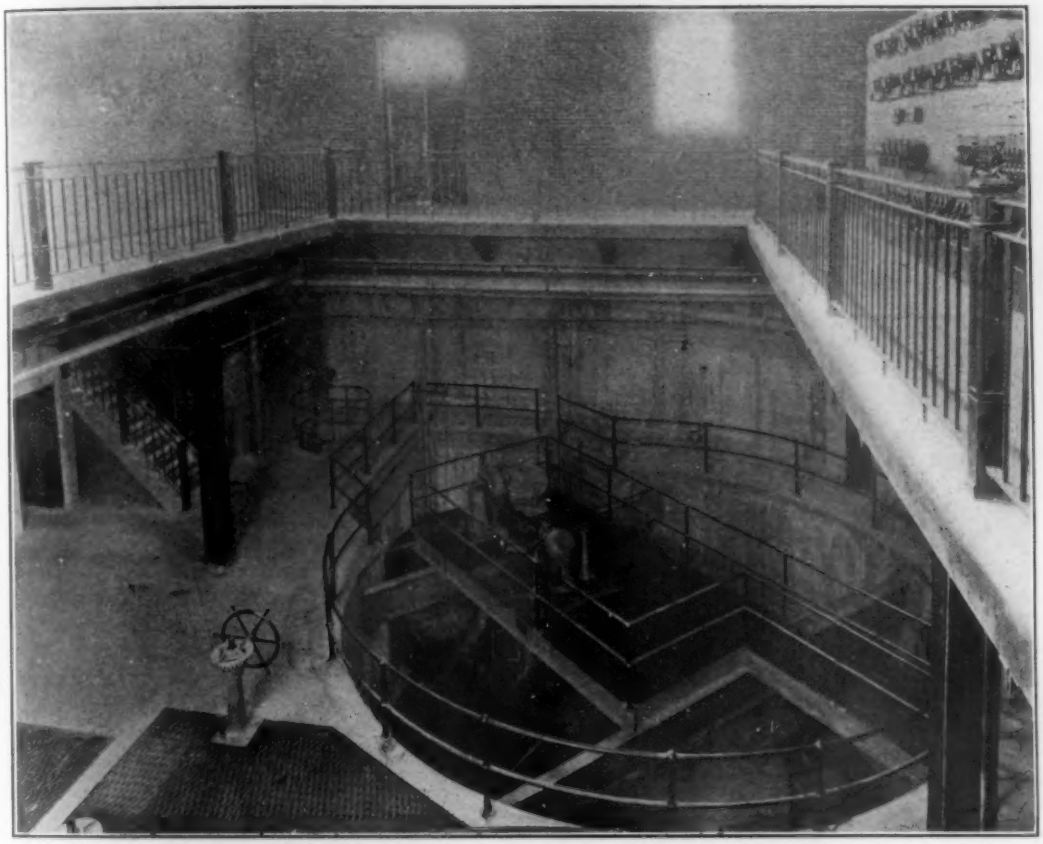
at the pump. The discharge from these pumps is into a 6-inch line which runs into the 48-inch force main at the end of the venturi chamber.

The effluent from the pumping-station is dosed with liquid chlorine gas at the top of the discharge riser then passes through a venturi tube, and is finally discharged through wood-stave pipe into Bergen Creek and Jamaica Bay. This process of disinfection causes a suspension of the activity of bacteria and protects the waters into which the treated sewage is emptied.

The chlorine apparatus is the latest Wallace & Tiernan automatic solution feed type, with a range of capacity for treating from 10 to 80 million gallons daily. There are five units with necessary scales, heaters, etc. Automatic control of the chlorine gas is accomplished by the use of pump solenoid-operated valves, so that whenever one or more pumps start up, the chlorine equipment starts functioning, dosing the effluent to the desired degree for whatever quantity discharged by the pumps.

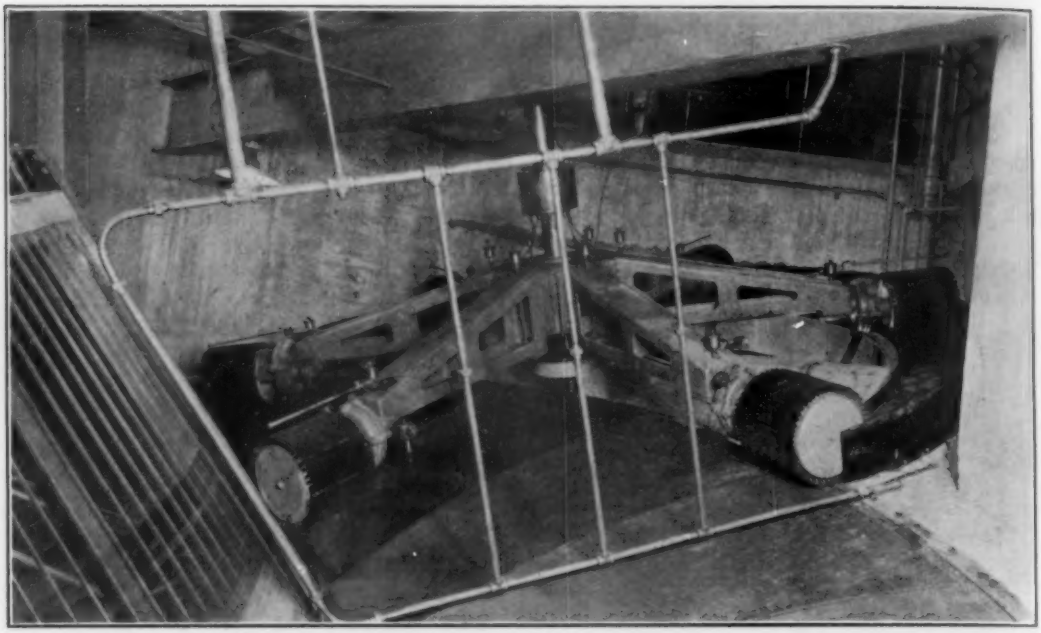
The quantity of sewage pumped is measured by means of a venturi tube equipped with an electrically operated indicating, recording, and integrating flow meter, with a maximum capacity of 80 m.g.d. These instruments are all located on the switchboard. A 48-inch motor-operated gate-valve is installed in the main discharge line in the venturi chamber and is controlled by push-button stations, one on the main switchboard and another in the venturi meter chamber.

A two-story brick building, 24 feet 10 inches x 37 feet 4 inches, of the same type of construction as the superstructure of the screening and pumping station, is at the effluent end of the grit chamber. This building contains a grit storage hopper and four sludge storage hoppers for the screenings from the disc screen filters, as well as the grit conveyor and elevator.



INTERIOR OF JAMAICA PLANT AS SEEN FROM GALLERY

The aforementioned crane and bucket runs underneath the building. The grit and sand from the four channels of the grit chamber is picked up by the bucket, carried in under the building, and deposited in a grit hopper. A screw conveyor in the hopper carries the residue to one end and discharges it onto a bucket elevator, which raises it to the grit storage



DETAIL SHOWING ROLLER BRUSHES FOR CLEANING REVOLVING SCREEN AT JAMAICA PLANT

tank.

It is unnecessary for the plant operators to come directly in contact with or handle the screenings from the filters. The screenings or sludge is brushed from the surface of the disc screen filter and deposited in a pneumatic hopper having a capacity of 24 cubic feet and located at the head or back of each screen. When a hopper is full, it is sealed and the contents discharged to the grit chamber building and into the sludge storage tanks by compressed air. Two air-compressors and necessary receivers are located on the screen operating floor.

There is a truck passageway through the grit chamber building and directly under the grit storage tank and the four sludge storage tanks, so that the contents of these may be deposited directly into a truck and carted away. The discharge openings of the storage tanks are fitted with manually-operated valves. The grit and sludge from this plant is to be used for fill, but later the sludge will be carried either by truck or conveyed pneumatically to the city incinerator built on property adjoining the sewage disposal plant.

The heating plant, located on the same level as the disc screen filters, consists of a low-pressure sectional boiler supplying steam to radiators in the office, chlorine room, and toilet in the screening and pumping station and also in the grit chamber house. The main operating room and the pump room are both ventilated and heated by York heaters. The intake of the ventilator located in the pump room is fitted with a metal duct carried to the roof of the superstructure to insure a supply of fresh air to this underground part of the station.

The electrical equipment for supplying the current for the motors, etc., consists of three 50-kv.-amp. transformers for low voltage power and light. As a power factor corrector, a static condenser of sufficient capacity is also installed in the transformer room. The motors on the pumps are 4,000-volt, 3-phase, 60-cycle, and the motors for screens, compressors, and other apparatus are 220-volt, 3-phase, 60-cycle type. All mechanical apparatus is controlled by a switchboard made up of eleven slate panels located on the ground floor of the screening and pumping station. This control board is fitted with various recording and indicating instruments for determining the amount of power consumed and the quantity of water pumped.

The contract price was $1,656,949.40 for the complete plant, including sewer connections, grit chamber, grit chamber house, sewage treatment and pumping station, outfall, and all equipment.

The entire plant is automatic in operation. The method or system of sewage treatment and disposal is extremely simple, and by reason of its simplicity is highly efficient and effective.

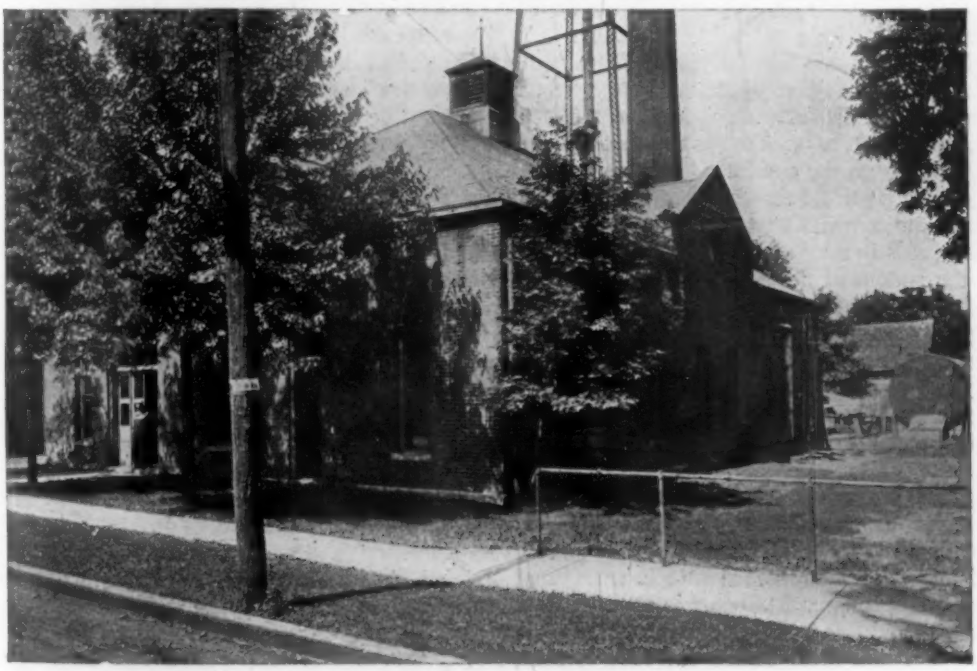
Thirty Years of Municipal Ownership in Rensselaer, Ind.

Municipal Lighting and Power Plant Purchased from Private Owners in 1896

IN 1896 the city of Rensselaer, Ind., purchased the local lighting plant from its owners at a price of $9,000. At this time a water system was desired and bonds for $40,000 were issued in order to install pumps and lay the necessary mains. The original plant, built in 1888, consisted of a small return tubular boiler and a 60-horsepower slide-valve engine belted to a single-phase, 133-cycle, 1,100-volt generator, to which was added a boiler and another power unit of the same type originally installed but of 80-horsepower size. Two years after the plant was purchased by the city it was necessary to provide greater generating capacity, and a 20 x 42-inch Corliss engine was installed to drive a 200 kw., 3-phase, 2,200-volt, 60-cycle generator with built-in exciter. Several years later when more generating capacity was needed, the 80-horsepower engine was replaced by a 15 x 20-inch high-speed automatic engine for belt driving a 100-kw., 3-phase generator equipped with belted exciter.

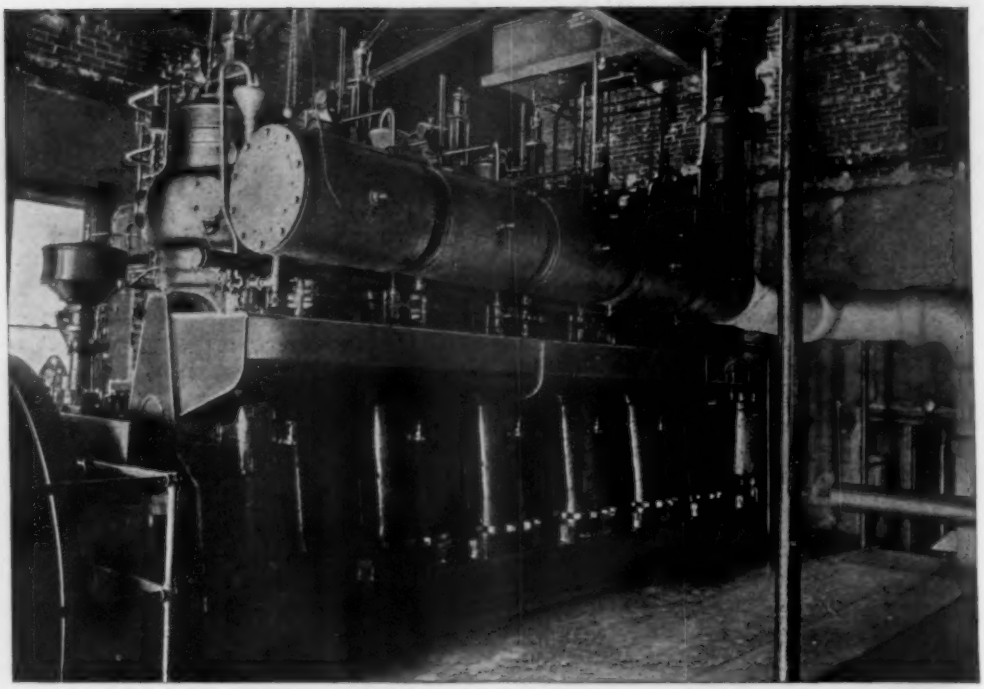
In 1921 when a further extension of the power-plant was necessary, a consulting engineer was employed and several projects considered. Early in 1923, the Council passed an ordinance for the purchase of a diesel engine involving an expenditure of $70,000. There was considerable opposition to this purchase, but at a special election on January 29, 1924, the diesel installation won by 963 votes in favor to 286 opposed.

A 550-horsepower Nordberg engine was eventually installed, direct-connected to a 375-kw. generator. While the installation of the diesel engine was not a difficult matter, a number of engineering problems arose due to moving the pumping equipment, building a new pump house and at the same time maintaining service. For some time it had been contemplated moving the pumps from the engine room and relocating them in a pit near the well. This became a necessity with the purchase of a diesel engine, as it was planned to place the engine where the pumps were located.



EXTERIOR VIEW OF THE RENSSELAER, IND., MUNICIPAL POWER-PLANT

The fuel tanks are seen at the right, and residences at the rear and adjacent to the alley at the left. On the roof can be seen the ventilating cupola through which the air suction is taken. This also shows the smokestack into which the exhaust is led



EXHAUST SIDE OF ENGINE, SHOWING EXHAUST PIPING TO WASTE HEAT GENERATOR

The plant at Rensselaer is situated in a residential section where either the noise of the exhaust or the pulsation of the suction would prove disagreeable and place the plant in disfavor. It is within three blocks of the main business section. Special precautions were taken to assure quiet operation. As a result, a passerby on the sidewalk in front of the plant is unaware that a 550-horsepower diesel engine is operating on the inside. The exhaust leaves the engine manifold through a 10-inch pipe and passes into a waste heat generator which materially aids in muffling the sound. After leaving the bottom of the heater, the gases are led to the brick smokestack, which is 70 feet in height by 42 inches in diameter. The 10-inch pipe from the generators terminates in a short length of pipe extending upward into the stack So effectively has the noise of the exhaust been muffled that no sound is noticed from the outside.

Special provisions were also made to quiet the noise of the suction. The air is taken through a screened ventilating cupola on the roof and passes downward into a wood duct about 6 feet square. This duct is about 12 feet in height and has two baffles near the top. It was found that these baffles, correctly located, practically eliminated all the noise of pulsations arising from the air suction. At the bottom of this duct is a six-section air filter having about 24 square feet of surface. This air filter serves a dual purpose, cleaning the air by removing all the dust particles and grit and also acting as a muffle. One filter section is removed each week for cleaning, and even though the engine is in a locality where dust conditions are not considered bad, an astonishing amount of dirt is removed at each cleaning.

Utilizing Exhaust Heat

The steam plant had for many years supplied heat to the three public schools located nearby. This arrangement was no hardship, as there was an ample amount of exhaust steam available. Furthermore, a small revenue was received. When the diesel was installed, it was decided to keep one boiler in service to supply steam during the heating season, as well as to serve as a standby to the diesel unit. The fire under this boiler was kept banked, but as an aid in keeping the boiler hot, it was planned to utilize the heat in the exhaust gases by first passing them through the waste heat generator.

This heat generator is connected in circuit with the boiler and carries boiler pressure. It has been found that perfect circulation is secured without the aid of circulating pumps. A test made to determine the evaporation showed that this amounted to 240 pounds an hour at 65 pounds pressure with the engine carrying a 200-kw. load.

Electric Rates Lowered

The very first month the diesel engine was placed in service it was apparent that the cost of operation was considerably lower than that of the steam plant. Preliminary tests showed that the saving in fuel alone approximated $35 per day. In order to build up the load, particularly during the day, so as to permit of showing still better results, it was decided after the first month of operation to make a reduction in rates, principally for cooking and power. The old and new rates are as follows:

OLD RATE		NEW RATE	
LIGHT		LIGHT	
First 200 kw. hrs....	.08	First 200 kw. hrs....	.07
Second 200 kw. hrs...	.05	Second 200 kw. hrs...	.05
All over 400.....	.04	All over 400.....	.04
HEATING AND COOKING		HEATING AND COOKING	
First 10 kw. hrs.....	.08	First 10 kw. hrs....	.07
Next 190 kw. hrs.....	.05	Next 200 kw. hrs...	.03
All over 200.....	.04	All over 210.....	.02½
POWER		POWER	
First 200 kw. hrs.....	.08	First 300 kw. hrs...	.06
Second 200 kw. hrs...	.05	Second 300 kw. hrs.	.05
Next 3,000 kw. hrs...	.04	Next 3,000 kw. hrs.	.02½
All over 3,400.....	.04	All over 3,600.....	.02¼

The above rates are subject to a further discount of 10 per cent if paid in ten days.

Load Increases

Soon after the diesel engine was placed in service there was a noticeable increase in load. The old steam plant was only capable of carrying a maximum of 300 kilowatts, but the first winter the diesel was in service it often carried for long periods its full load of 375 kilowatts. Occasionally during the evening load one of the steam engines had to be started to help the diesel over the peak. At first the day load averaged 60 kilowatts. At the end of the first year this load had grown to 200 kilowatts with a maximum of 240. The day load has now grown to a point where it approximates the average heavier night load. This increase in day load was brought about largely by a great use of household appliances, particularly the installation of electric ranges. Rensselaer has no gas service; consequently, cooking electrically met with ready favor.

There is little opportunity for securing a power load at Rensselaer. There is an elevator and a flour mill that operate from the municipal plant, but the demand for service is more or less irregular. All the pumping for the water system is also by motor-driven pumps. Outside of these power loads, practically all the load is derived from business and residential sections. At the present time, a line is being extended to a nearby stone quarry which will add about 150 horsepower to the day load.

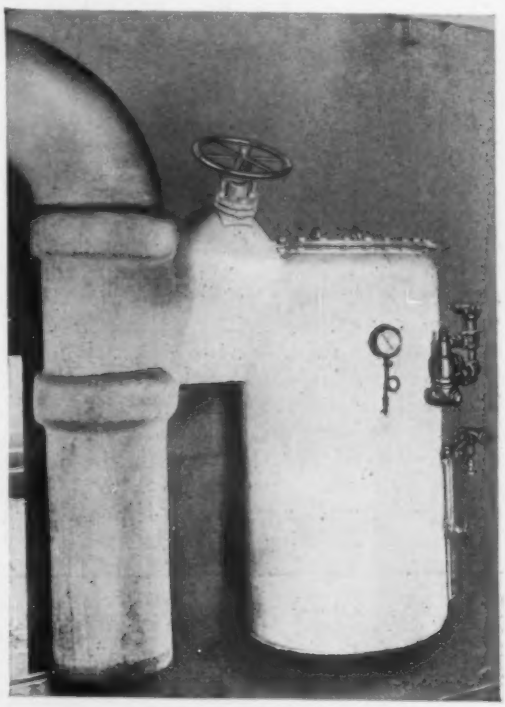
There were but two electric household ranges in service on the steam plant, the rate then being 4 cents per kilowatt-hour for all over 200. When the diesel was placed in operation, this was lowered to 2½ cents, and as a result a large number of ranges were put in.

Savings Effected

When new generating equipment was under consideration in 1921, a test was made on the Corliss engine to determine what a kilowatt-hour cost. This was made on the basis of fuel only and was found to be 1 4/5 cents. The test was made under ideal conditions and for a short period only. Actual operations over a long period showed a higher cost. For coal alone this averaged 2½ cents. The coal bill over a period of years varied from $19,000 to $24,000. It should be remembered that this is not the total cost of operation and does not include labor, lubricating oil, supplies, or repairs to the engine and boiler and boiler room equipment.

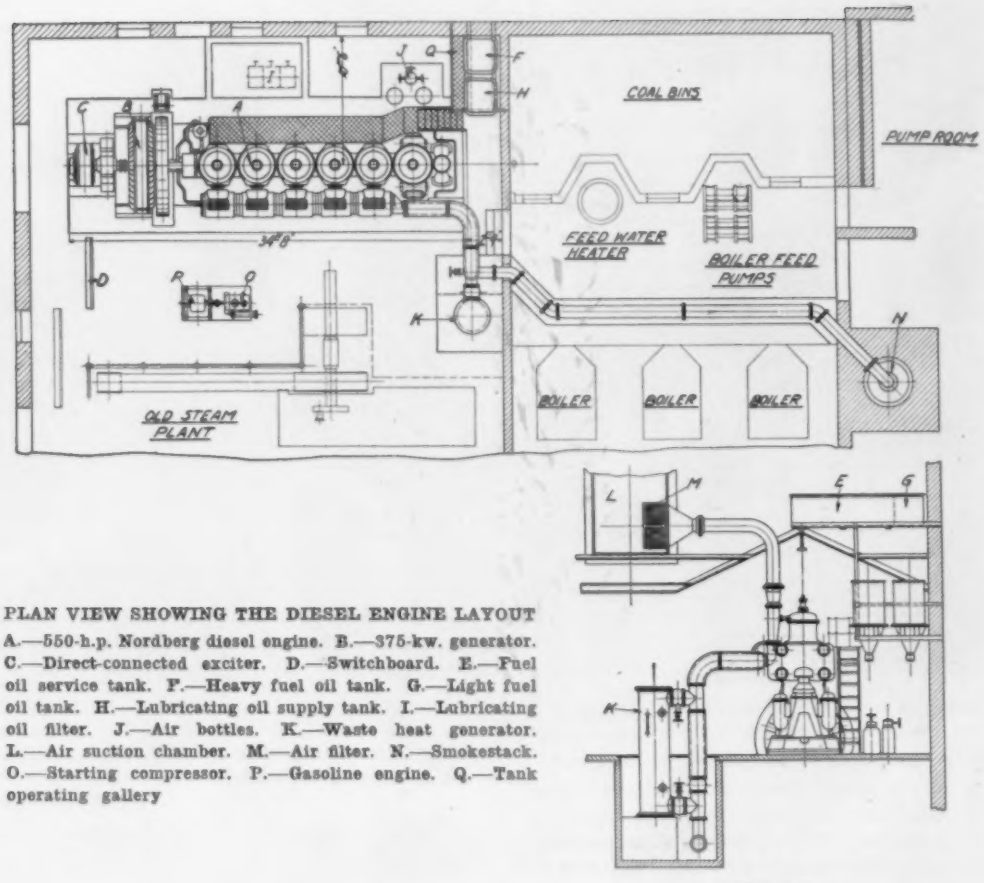
In 1922 the coal used amounted to $22,880 and developed 800,000 kilowatt-hours. The next year the expenditure for coal was $24,000 with 900,000 kilowatt-hours produced.

For the first twelve months of diesel operation, the total cost of operation was as follows: fuel oil, $8,186.05; labor, $4,788; lubricating oil $407.29; repairs and supplies $167; total, $13,548.34. For this sum 1,023,200 kilowatt-hours were developed, making the cost per kilowatt-hour 1.324 cents.



WASTE HEAT GENERATOR THROUGH WHICH THE EXHAUST GAS IS PASSED

Only the upper half of the heater is shown, the other half being located below the floor



PLAN VIEW SHOWING THE DIESEL ENGINE LAYOUT

A.—550-h.p. Nordberg diesel engine. B.—375-kw. generator. C.—Direct-connected exciter. D.—Switchboard. E.—Fuel oil service tank. F.—Heavy fuel oil tank. G.—Light fuel oil tank. H.—Lubricating oil supply tank. I.—Lubricating oil filter. J.—Air bottles. K.—Waste heat generator. L.—Air suction chamber. M.—Air filter. N.—Smokestack. O.—Starting compressor. P.—Gasoline engine. Q.—Tank operating gallery

ELEVATION

Twenty-four hour service is maintained with but three engineers. Their shifts are so arranged that during the heavier load period two men are on duty to permit taking care of any emergency that may arise with either the light or water system. None of these men had had any experience with diesel engines prior to this particular installation. The labor charge includes such extra labor as is necessary during shut-down periods, also, one-third of the superintendent's salary, the other two-thirds being borne by the water department and the electric distributing system. Included in the repair charge are two days of expense of the factory expert, who performed some additional work at the time of making the first annual inspection of the plant.

On a fuel cost comparison, the diesel plant has distinct advantage over the steam plant. In 1923, it required $24,000 in coal to produce 900,000 kilowatt-hours, or a fuel cost of 2.66 cents per kilowatt-hour. With the diesel engine, $8,186.05 in fuel oil developed 1,023,000 kilowatt-hours, or a unit cost of 0.8 cents. This amounts to a reduction of over 300 per cent.

The cost of fuel oil includes the expense of unloading the tank cars at the railroad, carting to the plant, and pumping into a storage tank. It has been contemplated putting in a pipe line which would further reduce the operating expense. Oil is stored in two tanks having a combined capacity of 49,000 gallons.

What Taxes Mean

"Do we complain too much about taxes? There's this to be said for them: The fact that you have to pay them means that you are alive, not dead, that you have some property and are not a pauper, that you live in a civilized land and not in a pagan jungle."

From *Brattleboro Reformer* (quoted in annual report of the Town of Springfield, Vt.).

Effective Snow-Removal Methods

WILLOUGHBY, OHIO, KEEPS ITS WIDE THOROUGHFARES CLEAR OF SNOW WITH THE FORDSON TRACTOR AND HADFIELD-PENFIELD ONE-MAN GRADER

BARBER-GREENE LOADER WITH SNOW TRAILER CLEARING THE STREETS AROUND BOSTON COMMON

The trailer was developed to meet the demand for a machine which would load to the side, many users finding that they had some difficulty in teaching truck drivers how to back up under the discharge end of the regular snow loader. The side-discharge trailer is mounted on a Timken roller axle and is driven by a separate two-cylinder LeRoi gasoline engine. The engine drives not only the belt, but also the turntable. This makes it possible to turn the discharge end in any direction under the power of its own engine

Two Notable Examples of Street Widening in New York City

THE NORTHEAST CORNER OF 116th STREET AND PARK AVENUE, NEW YORK CITY, BEFORE WIDENING WITH SHEET ASPHALT PAVING

The constantly increasing traffic on city streets and suburban highways has necessitated widening in many cases. On suburban highways where officials have had the forethought to acquire the necessary right of way when the original hard-surfaced road was laid, it involves simply some grading and the extension of the hard surface to the proper width. In cities the problem is somewhat different. Fortunately, in New York City, however, there are many congested streets where the sidewalks are much wider than required for the normal use of pedestrians. On these facing pages are shown two notable examples of street widening. In one a considerable strip of sidewalk has been removed and in the other the center park area has been reduced.

SAME CORNER AFTER WIDENING, SHOWING ADDITIONAL LINE OF TRAFFIC PROVIDED; MADE POSSIBLE BY REMOVAL OF SIDEWALK ENCROACHMENTS

PARK AVENUE FROM 34th TO 39th STREET, NEW YORK CITY, BEFORE WIDENING PAVING
Photograph taken looking north from the south of the 71st Regiment Armory before work was started by the P. T. Cox Co., Inc., contractors for the sheet asphalt paving

Fourth Avenue from 32nd Street south has recently been widened to meet the traffic demand by narrowing the sidewalks. The thoroughfare north of 32nd Street is known as Park Avenue and south of 32nd Street as Fourth Avenue

PARK AVENUE, 34th TO 39th STREET, AFTER WIDENING WITH SHEET ASPHALT PAVING
Note that the park areas have been reduced in width to provide the additional traffic space rather than cutting down the width of the sidewalks

Thoroughfares Widened to Accommodate Increasing Traffic in the Middle West

A TYPICAL SCENE ON MICHIGAN AVENUE, WAYNE COUNTY, MICH., BEFORE IT WAS MADE INTO A SUPER-HIGHWAY BY THE ADDITION OF A SECOND CONCRETE ROADWAY AND A WIDENING OF THE ORIGINAL PAVEMENT

MICHIGAN AVENUE, WAYNE COUNTY, MICH., AFTER WIDENING TO HANDLE THE TREMENDOUS INTER-CITY MOTOR TRAFFIC OF THIS DISTRICT

WOODWARD AVENUE IN WAYNE COUNTY, MICH., IN 1920 BEFORE IT BECAME A SUPER-HIGHWAY WITH TWO 44-FOOT CONCRETE PAVEMENTS ON EITHER SIDE OF THE INTERURBAN RAILWAY STRIP

WOODWARD AVENUE IN OAKLAND COUNTY, MICH., THE CONCRETE SUPER-HIGHWAY BETWEEN DETROIT AND PONTIAC

Overcoming City Planning Inertia

By Campbell Scott

UNDER the laws of some states the creation of planning boards is mandatory upon the larger municipalities and optional with the smaller ones. Under no law is it obligatory upon the part of the municipal government to appropriate funds for planning purposes, except that under a special act certain Indiana commissions receive a small part of the tax levy for planning purposes.

In Massachusetts, New York, Pennsylvania, Ohio, and New Jersey, as examples, many planning bodies which have been organized for years have accomplished little or nothing toward comprehensive planning. They are merely drifting along, holding perfunctory meetings, passing on matters which are now and then submitted to them and occasionally submitting a voluntary recommendation to the city council—which nine times out of ten is probably tabled.

Seven Lacks and Prejudices

There are probably hundreds of American city planning boards or commissions which are substantially inert. The majority of them are in that state because of the existence of one or more of the following conditions:

1. **Lack of a broad conception of their subject and their functions**
2. **Lack of understanding and consideration by the municipal government**
3. **Lack of public encouragement, generally due to the taxpayers' misconception of city planning**
4. **Lack of appropriations adequate for the retention of technical advisers and a working staff**
5. **Self-sufficiency and aversion to "outside experts"**
6. **Lack of time for the work, due to demands of personal business**
7. **Jealousy and opposition of certain public officials**

In this article by the President of the Technical Advisory Corporation, of New York, these seven causes of city planning inertia are analyzed and remedies are suggested.

Unfortunately, appointees to planning board membership are not infrequently unsuited by inclination, training, or experience for town planning study. Perhaps some such appointments are made to satisfy political debts; though some would allege that occasionally a political grudge is thus paid off.

On the other hand, planning boards are often composed of the highest type of citizens—men and women—who take their responsibilities seriously and who are capable, public-spirited, and independent. But many such boards are prevented from accomplishing satisfactory results through causes beyond their control.

As one studies the records of accomplishment of planning boards or makes special inquiry as to planning activities, he is astonished to learn how little real planning is actually being done, especially by the smaller municipalities, and how inert are most planning boards.

Causes of Inertia Analyzed; Remedies Suggested

It will be interesting to analyze the seven principal causes for this condition of inertia:

—1—

Some planning commissioners—especially those who have taken the time to read up on the subject of city planning—are remarkably well informed as to their subject and their duties. But some have only a vague conception of how to go about obtaining practical results. As a consequence, boards composed principally of such members seldom "get anywhere." They may now and then pass perfunctorily on a subdivision plat or a proposed street widening; but they lack the understanding and the vision to plan for their city on a comprehensive scale. Generally the city government gives their few recommendations but slight consideration and the citizens scarcely know of their existence.

This is the type of planning board which needs educating and bolstering up.

—2—

Many planning boards are created by the municipal government merely because the law requires it, or a group of public-spirited, progressive citizens has urged it. When such boards become "troublesome" by making too many recommendations as to "how to run the city," their suggestions are pigeonholed. Resulting discouragement leads to total inactivity.

Such an attitude upon the part of a municipal government—and it is not at all infrequent—is nearly always due to ignorance of the purpose and possible usefulness of comprehensive planning.

—3—

Not infrequently, especially where the town meeting form of government prevails or where substantial appropriations are made only after referendum, a capable and earnest planning board and a progressive municipal government are prevented from going into comprehensive planning, or even formulating a zoning plan, because of lack

of financial support from the voters.

In such cases the citizenry needs enlightenment and fitting with long-distance glasses. A few good jolts, and comparisons with more progressive neighboring towns, are often helpful.

—4—

In a great number of towns where excellent planning boards have been struggling along for years, the time is reached when the board realizes that, in order to accomplish practical results, it *must* have an appropriation sufficient to retain planning specialists. A communication to the city council requests an appropriation of, say, $10,000 in the forthcoming budget. Eventually $500 is appropriated and the council thinks that it has been very generous. So the discouraged board drifts along for perhaps a year or two longer with picayune appropriations, inadequate for any practical purpose, until its members resign in despair.

This one example is typical of many actual cases, and in not a few such cases has the attitude of the local government been completely reversed on their being educated on practical planning and its benefits.

—5—

Now and then a planning board is encountered whose members feel that they know all there is to know about their own city and about city planning in general. They have no use for "outside experts." Occasionally they may call on the city engineer for information or assistance, but at best they do only piecemeal planning. Rarely do they look further ahead than a year or two or do anything of a comprehensive nature.

—6—

There are some planning boards composed of a number of active, public-spirited business men, interested in doing the right thing for their city and with the best intentions in the world. But they are unable to give much of their time to the work, so it drags along desultorily. Without the advice and assistance of experienced specialists, they engage in piecemeal, instead of comprehensive, planning. The result is that their work is ineffective and their recommendations are seldom taken seriously by the "city fathers."

—7—

Many planning boards are thoroughly competent and entirely willing, even anxious, to go in for comprehensive planning under the guidance of qualified planning specialists. But they find themselves handicapped at every turn. Their requests for appropriations may be "turned down" or their recommendations bitterly opposed by some public official and as a consequence squelched by the city council.

It may be the mayor, the city engineer, or the chairman of a committee who will interpose the obstacle. Or perhaps the mayor, the city engineer, and all the others are interested and favorable to the planning board and its proposals, except a group of councilmen who are jealous and suspicious. Thinking the planning board is trying to usurp the council's prerogatives, they may table all the board's requests and recommendations indefinitely.

Jealousy, suspicion, and selfish interest, generally founded on a misconception of city planning, frequently are the retardants to city planning progress.

What Can Be Done About It?

We have now reached the important question: What can best be done toward removing city planning inertia; toward imparting to the taxpayer in general and to the city official in particular a proper grasp of the real intent and expected result of *proper* city planning; toward overcoming petty jealousies and the unjustified opposition of some city employees; and toward loosening municipal purse strings for comprehensive planning purposes?

The answer to this broad general question can be given in one word—*Education.*

Most planning board and council members are busy men, with their personal affairs to attend to and livings to make. As a rule, they can't or don't devote much of their leisure time to reading up on city planning, especially in finding out what is actually being accomplished thereby in the more progressive cities. Often they have but a vague idea of what it is all about, and that idea mostly erroneous.

It is a well-known fact that the majority of busy men will listen attentively for two hours to an interesting speaker, but they will go to sleep in twenty minutes over a printed copy of the same address. And these same busy men will at different times read several ten-page pamphlets on a particular subject when they would do no more than riffle the two hundred pages of a book on the same subject.

It cannot be expected that city councils and planning boards will, as a rule, receive their education on city planning by studying thick—and sometimes dry—tomes on the subject, or by attending city planning conferences and devoting several days to listening to long papers that frequently are "over their heads."

Aids for Civic Organizations, Planning Boards and City Governments

What the great majority of civic organizations, planning boards, and city governments need to set them on the right road towards effective city planning is a clear understanding of the fundamental principles of comprehensive planning, the best methods and technique to employ in its accomplishment, what it has accomplished elsewhere, and what it can be expected to accomplish locally.

The activities of the Federal Department of Commerce, under Secretary Hoover, in disseminating information have been of incalculable benefit in creating a public sentiment favorable to zoning. Several years ago the Department issued a Zoning Primer which has since had an enormous circulation. It informs the novice

briefly and in non-technical language what zoning is, what its advantages are, and how it should be done. Undoubtedly, this brochure has done more good in the zoning cause than any other one treatise on the subject.*

The Department of Commerce has now in preparation a corresponding primer on city planning. A review of the preliminary draft of this document shows it to be an excellent treatise on the subject which, when given wide circulation, promises to be highly effective. If it is carefully read and digested by those willing to inform themselves on the subject they will, beyond question, be better informed and many of their illusions dispelled. It is hoped that Secretary Hoover's department will continue to educate the public on city planning through other simple, informative literature as effective as its zoning literature.†

Although the broadcasting of printed information on city planning will undoubtedly do an immense amount of good, nevertheless there will be large numbers of municipal officeholders and even planning-board members who will not take the trouble to properly inform themselves through reading what may be sent them. Many of them can be informed and "sold" on comprehensive planning only by word of mouth. City councils often need to be pushed into action through having some one paint for them a word picture of unfavorable conditions existing in their city and another picture showing what can be done with their city if they go about the job in the right way.

A Preliminary Survey to Overcome Inertia

It has been found in many cases that one of the most effective instruments for setting planning bodies in motion is the reconnaissance or preliminary survey. In a considerable number of cities and towns which now have comprehensive plans in effect, the planning boards struggled along for several years, accomplishing little or nothing toward comprehensive planning, until the making of a preliminary survey served as the means for overcoming inertia.

A preliminary city planning survey is, more than anything else, a study of a city's physical condition. If made by impartial specialists, as it should be, it will disclose those conditions and factors, good and bad, in a community which would be likely to affect, or would be affected by, comprehensive planning and their relative importance. The facts and conditions disclosed will, after careful analysis, make it possible to formulate a definite program of study for comprehensive planning. The report on the survey will discuss those conditions which are good enough as they are, for the future as well as the present; those which are bad and need correcting; and those which are inadequate for either the present or the future. The report should serve, really, as the first step toward the comprehensive plan. It should be not only impartial but fearless in its expression of opinion of existing local conditions. But it should also be constructive, in that it will point out the effect of unfavorable conditions and how they may be remedied. It should be couched in such convincing terms and supported by such evidence that it will serve as a spur to action on the part of those who have it in their power to remedy the conditions.

Considered as a diagnosis of the city's physical condition, it should make it clear that the remedy may be found in a comprehensive plan for correcting past errors and present unfavorable conditions, and for providing for the civic improvement and other needs of the future.

It is not always sufficient to present such a report in printed form. It is best to present it orally, with elaboration where necessary, not only to the planning board but to the council. This will give the opportunity of driving home the city planning idea and explaining to the council the beneficial results they may expect from a comprehensive plan.

During the progress of the reconnaissance survey, advantage should also be taken of the opportunity for spreading city planning information far and wide in the community through newspaper articles and talks to civic organizations and city officials.

When the report is completed and presented to the city government, it should be published in full in the local newspapers, in order that the entire public may be enlightened and its support secured. The experience of many cities for which such surveys have been made has demonstrated that newspaper editors almost invariably cordially support the city planning movement and are generous with informative and favorable editorials.

When a preliminary survey is made and the city's physical status and needs are disclosed, it is then possible not only to formulate a definite city planning program but to prepare a dependable estimate of cost of comprehensively planning for the city's future development. And then the planning body can approach the city government for an appropriation with dependable figures and forcible arguments.

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* Revised editions of "A Zoning Primer" and "A Standard Zoning Enabling Act Under Which Municipalities May Adopt Zoning Regulations" have recently been issued. See page 889, THE AMERICAN CITY, December, 1926.

† For the text of the City Planning Primer, with acknowledgment for the privilege of printing it in advance, see pages 89-95, THE AMERICAN CITY, January, 1927.

Wallingford Water-Supply and Pine River Filter and Pumping Plant

By William A. MacKenzie

Superintendent and Engineer, Board of Water Commissioners, Wallingford, Conn.

THE Wallingford water-works were built in 1882 and for thirty-nine years, or up to the year 1921, the increase in the number of services and consumption per capita was fairly uniform. During this period, in the year 1908, Lane's Pond, consisting of three-fourths of a square mile of watershed, was added to the supply and diverted into Pistapaug Reservoir. The total watershed, which amounted to only 1¼ square miles, was developed to its maximum capacity by drainage ditches and storage reservoirs. The total storage capacity amounts to 1,222,000,000 gallons, of which 700,000,000 gallons is available or can be drawn into the main pipe lines, which are about five miles in length, and the water delivered into the borough by gravity.

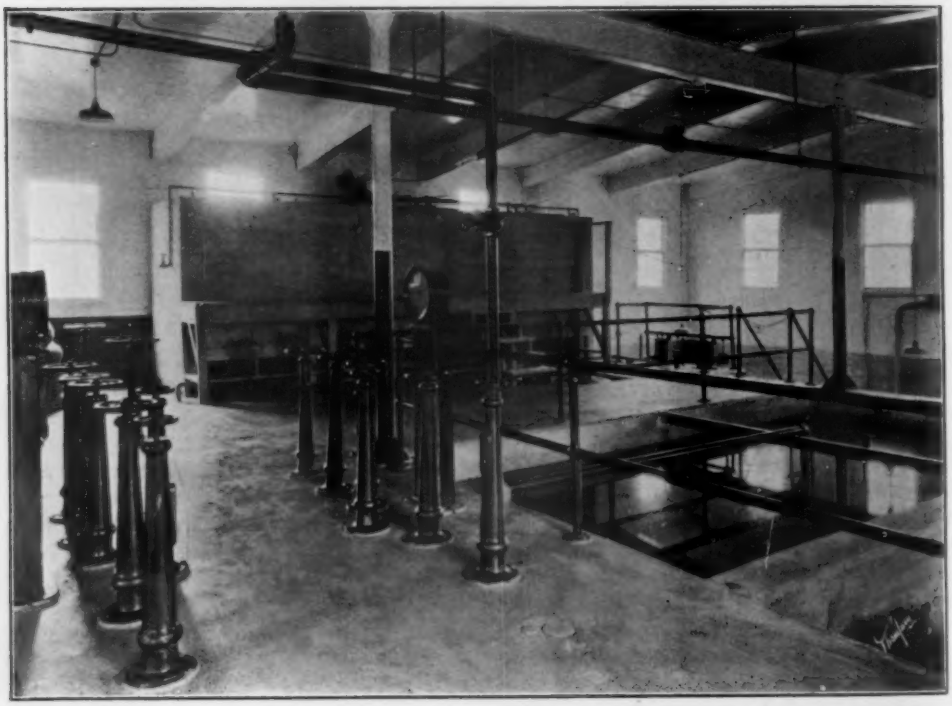
During the last five years, with an average rainfall of about 46 inches, the average draft has amounted to 1,150,000 gallons per day per square mile of watershed, with one year of draft equal to 1,257,000 gallons per day per square mile of watershed. The present population supplied is 12,350. Twenty-six per cent of the services have been metered for several years, and the per capita consumption, including the factory use, has been reduced from 135 to 110 gallons per day. This saving has been accomplished by rigid inspection of flat-rate services.

PINE RIVER FILTRATION AND PUMPING PLANT
Low dam in Pine River is seen at right

Starting in 1921, an abnormal increase in services per year, two and three times greater per year than all previous records, as indicated by the graphic chart, showed that the water situation, on account of a small watershed, would be serious providing we had a year or more of low rainfall.

After a thorough study of the situation as to the cost of an additional water-supply and the time it would take to build it, a filtration

AERATOR OVER CLEAR-WATER BASIN AT WALLINGFORD



ONE OF THE FOUR FILTERS IN THE WALLINGFORD PLANT, SHOWING OPERATING FLOOR AND CHEMICAL TANKS

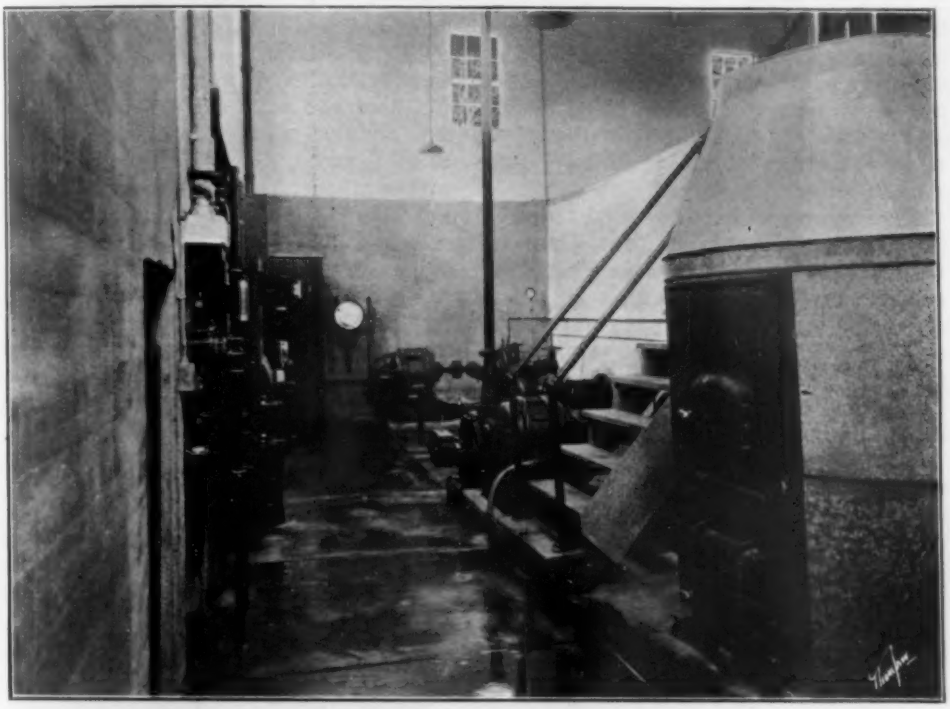
and pumping plant was proposed. During 1925, the Water Commissioners recommended the construction of a two-million-gallon mechanical filtration and pumping plant near Pine River.

The location of the new filter plant is within 400 linear feet of the main pipe lines to town, and at this location the river has a watershed of 8.8 square miles. For nine months of the year this stream without storage will supply four million gallons per day, with the exception of a few weeks during the summer, when the supply might drop to a little below two million gallons per day.

The intake in the river was obtained by increasing the width and depth of the stream and then forming a low, inexpensive dam by driving 6-foot Lackawanna steel sheeting across the stream with concrete cut-off walls at each end. The water enters the 18-inch tile intake pipe through a coarse bar screen and passes through a ⅜-inch mesh screen in the suction well of the raw-water pump. This intake pipe is laid on a concrete footing about 4 feet below the surface of the ground. Only the top part of the joints is cemented, and the pipe is encased with crushed stone, which permits a large amount of ground water to enter the pipe.

The filter and pump building combined is 68 feet long by 43 feet wide. The substructure and tanks are of reinforced concrete and 14 feet in depth. The pump room extends across the south end of the building and is 15 feet in width. The coagulation basin extends the entire length of the filter building and is 19 feet in width and 14 feet in depth. This basin is divided by a longitudinal baffle so that the length of flow is 100 feet and the present period of detention is two hours.

The aerating chamber, which is a necessary adjunct in order to obtain a good effluent, is in the corner over the coagulation basin. After experimenting with the various types of spray nozzles, it was decided to cast a very simple nozzle of a new design that filled all the requirements of large capacity under low heads, freedom from clogging, and a uniform spray.



SECTION OF PUMP ROOM, SHOWING WASH-WATER PUMP AND BLOWER AND HIGH-DUTY CLEAR-WATER PUMP

The other half of the substructure contains the pipe gallery and four ½-million-gallon filter units. The clear well is located under the filter beds, being about 6 feet in depth, and holds sufficient filtered water for one hour's pumping.

Each filter is 10 feet by 18 feet in area. A longitudinal cast iron collecting pipe runs along the bottom of each bed, with 1½-inch brass laterals on 6-inch centers. Inverted bronze collecting strainers are screwed into the laterals on 6-inch centers. Over the strainers or col-

lecting pipe system is placed the filtering material. The first foot consists of four layers of graded gravel, ranging in size from ¾- and ⅝-inch up to the top layer of ¼-inch gravel and some smaller material. On top of the gravel is placed 30 inches of filtering sand having an effective size of 0.33 m.m. to 0.40 m.m. and a uniformity coefficient of about 1.65. Between the gravel and filtering sand is located the air-blowing system for loosening the sand when washing the beds. This consists of a 2-inch main brass feed pipe with 5/16-inch brass laterals on 4-inch centers.

The plant is equipped with the necessary venturi meter on the raw-water pipe and a General Electric flow meter on the clear-well pump discharge main. Automatic floats, proportionate chemical feeders to the coagulation basin, gages for loss of head in filters, depth of water in tanks, and automatic rate controllers on the filters are also installed. The filtered water is chlorinated with a diffuser located at the outlet of a central chamber with a dry feed Paradon apparatus.

Standard equipment has been used throughout the filters and pumping plant, brass or bronze pipe being used wherever there was danger of corrosion or difficulty of replacing pipes.

Worthington centrifugal pumps and General Electric motors ranging from 15 to 75 h. p. were used. Although the present plant has a two-million-gallon capacity, all piping is installed for a future four-million-gallon capacity. The 1¼-million-gallon capacity of the present pumping plant can also be doubled by changing the pump impellers and installing a larger motor on the present pump bases.

Operation Satisfactory

The results obtained have been very satisfactory. A recent test indicated that the raw water containing 2,200 bacteria per cubic centimeter at 20° centrigrade and 600 bacteria at 37° centigrade has been reduced to 9 and 3 bacteria respectively in the filtered water. Colon bacilli were present in 10 c.c. of the raw water, but negative in 10 c.c. of the filtered water. The color was also reduced from 27 to 3. It is not necessary to use any soda ash, but the amount of alum used is ¾ to 1½ grains per gallon, depending on the condition of the river water, and 0.36 parts of chlorine per million, or 3½ pounds of chlorine per million gallons.

The completed filtering equipment for the present two ½-million-gallon units and piping capacity for an ultimate 4-million-gallon plant, together with the substructure, superstructure, tanks and pipe lines, cost about $36,000. The completed electrical and pumping plant has cost an additional $6,000. For an additional $7,000 the other two units can be equipped, making the 2-million-gallon filter plant proper cost about $43,000. Generally speaking, the first million-gallon capacity will cost about $24,000, and from $14,000 to $18,000 for each additional million gallons, depending on tank capacities and construction conditions.

The plant was designed in conjunction with the Norwood Engineering Company, of Florence Mass. The plant was constructed under three separate contracts—the concrete substructure, the brick superstructure, and the furnishing and installing of the filter equipment and pumping plant, awarded to the Norwood Engineering Company.

The entire plant was built under the direction and supervision of the writer. The present members of the Board of Water Commissioners are: Charles H. Nearing, Evarts C. Stevens and Jonathan H. Child.

Garbage Disposal in Glendale, Calif.

THE city officials of Glendale, Calif., are considering the installation of a new system of garbage disposal in which the dehydration method will be utilized. They have inspected similar plants in Los Angeles under the guidance of the Los Angeles Health Department. At present, garbage disposal in Glendale is under a contract which calls for an annual expenditure of $30,000. It is thought that by using the dehydration method the outlay can be turned into an asset and the city receive an annual income instead of paying out this sum each year for the disposal of garbage.

By dehydrating kitchen refuse from homes and hotels, the odorless solids that remain will be pulverized and sacked and sold as fertilizer. Further investigations are under way now to determine whether the dehydration system can be profitably and efficiently carried on, and if this is proved, the city will proceed with the installation of the necessary plant and equipment.

We are indebted to the Chamber of Commerce, Glendale, Calif., for this information.

Three and a Half Years' Service from One-Man Grader

THE city of Brockton, Mass., according to Arthur Creedon, Superintendent of Streets, purchased a Model-C Wehr grader 3½ years ago and is still using this machine for road construction, street maintenance, and snow-removal work every day in the year. Mr. Creedon advises that the machine has paid for itself several times over because of the low upkeep cost and the various classes of work it has been able to take care of. Last year the city purchased a newer and heavier Model-D grader, which is also in constant use.

Trafficking in Humor

Let Henry Do It

Henry Ford, having achieved quantity production of cars, should now try his hand on quantity production of parking space.

—Greenville Piedmont.

Hitting the Nail on the Head

Tommy was asked by the teacher to write an essay on safety. It was a very good essay, indeed, and one sentence we take the liberty of quoting. Says Tommy:

"One of the many advantages of crossing crossings carefully is that you get to the other side."

We have been for five years or more teaching safety and preaching safety, and all we have said could be boiled down to Tommy's one sentence: "To get to the other side." Traffic regulations were not made to keep policemen busy. They were made to protect you. If every one would look at them in that light, they would not need any boosting.

—Ottawa Electric Railway News.

Even as You and I

When Noah sailed the well-known blue,
He had his troubles as well as you.
For days and days he drove the ark
Before he found a place to park.

(*Author Unknown*)

Parking for Tomorrow's Matinee

"Where's Bill going with the car?"
"To a matinee."
"But there's no matinee till to-morrow."
"He's got to find a place to park, hasn't he?"

—Life.

Motor Mathematic

London Gentlewoman and Modern Life

The girl—"And might I ask why you pulled me up?"
The constable—"Because you were traveling nearly sixty miles an hour."
The girl—"Impossible, my dear old police trap. I haven't been out an hour."

The Highway of the Future: Circa 2026
As Conceived by Ken Chamberlain

Revealed

"Where is Times Square? asked the stranger in New York City.

"I'm standing on it," replied the traffic officer.

"No wonder I couldn't seem to find it," came from the disturbed stranger.

—Christian Science Monitor.

Parking space has been discovered at last. Afghanistan has one motor-car for every 1,200,000 inhabitants. *—Wichita Eagle.*

A Lively Theme

"I wish, Matilda, you would agree not to talk when I am driving in traffic."

"We can discuss that as we go along, Adolphus."

—London Gaiety.

Don't Spread This

Si—"Sara, is there anything you want from town this mawnin'?"

Sara—"You might stop in at one of them there stores and buy a jar of that there Traffic Jam, I am ahearin' so much about."

—Source Unidentified.

A Comedian Looks at the Parking Problem

Will Rogers, famed cow-boy comedian, visualizes the parking problem in the word picture of a business man who after driving around for two hours looking for a place to park, walks past his home on his way downtown.

—Current Affairs.

New Financial Statistics of Cities

From the Forthcoming Report of the Bureau of the Census, U. S. Department of Commerce, for the Fiscal Year 1925

GOVERNMENTAL-COST PAYMENTS FOR EXPENSES OF MUNICIPAL DEPARTMENTS: 1925

	Group IV Cities of 50,000 to 100,000	All General Departments	General Government	Protection to Person and Property	Conservation of Health	Sanitation	Highways	Charities, Hospitals, and Corrections
82	Somerville, Mass.	$2,701,996	$145,011	$538,537	$62,723	$290,985	$210,484	$90,884
	Per capita	27.21	1.46	5.42	0.63	2.93	2.12	0.92
	Per cent of total		5.4	19.9	2.3	10.8	7.8	3.4
83	Fort Wayne, Ind.	2,469,682	90,636	533,347	19,023	125,980	147,721	.....
	Per capita	25.24	0.93	5.45	0.19	1.29	1.51	.....
	Per cent of total		3.7	21.7	0.8	5.1	6.0	.....
84	Jacksonville, Fla.	2,739,557	163,666	669,081	68,160	312,656	393,098	80,011
	Per capita	28.62	1.71	6.99	0.71	3.27	4.11	0.84
	Per cent of total		6.0	24.5	2.5	11.4	14.3	2.9
85	Knoxville, Tenn.	2,237,805	167,279	489,008	64,496	139,108	339,750	204,125
	Per capita	23.65	1.77	5.17	0.68	1.47	3.59	2.16
	Per cent of total		7.5	21.9	2.9	6.2	15.1	9.1
86	Evansville, Ind.	2,066,500	89,293	450,861	27,004	83,901	119,934	22,284
	Per capita	22.08	0.95	4.82	0.29	0.90	1.29	0.24
	Per cent of total		4.3	21.9	1.3	4.1	5.8	1.1
87	Lawrence, Mass.	3,463,951	151,557	734,299	80,662	303,632	381,438	222,196
	Per capita	37.05	1.62	7.85	0.86	3.25	4.08	2.38
	Per cent of total		4.4	21.2	2.3	8.8	11.0	6.4
88	Savannah, Ga.	1,706,793	179,545	499,480	50,066	250,232	115,762	63,798
	Per capita	18.33	1.93	5.37	0.54	2.69	1.24	0.69
	Per cent of total		10.5	29.2	2.9	14.7	6.8	3.7
89	Schenectady, N. Y.	3,796,146	232,286	615,633	105,352	534,081	265,868	150,460
	Per capita	40.91	2.50	6.63	1.14	5.76	2.86	1.62
	Per cent of total		6.1	16.2	2.8	14.1	7.0	4.0
90	Allentown, Pa.	1,707,355	112,833	239,552	33,703	134,624	206,389	2,000
	Per capita	18.53	1.22	2.60	0.37	1.46	2.24	0.02
	Per cent of total		6.6	14.0	2.0	7.9	12.1	0.1
91	Wichita, Kans.	2,185,224	91,160	408,367	31,221	111,354	128,500	34,715
	Per capita	24.44	1.02	4.57	0.35	1.25	1.44	0.39
	Per cent of total		4.2	18.7	1.4	5.1	5.8	1.6
92	Bayonne, N. J.	3,617,701	212,229	904,997	79,273	264,865	142,025	114,114
	Per capita	40.76	2.39	10.20	0.89	2.98	1.60	1.29
	Per cent of total		5.9	25.0	2.2	7.3	3.9	3.2
93	Long Beach, Calif.	4,006,863	317,948	685,000	53,613	358,514	417,687	49,165
	Per capita	45.46	3.61	7.77	0.61	4.07	4.74	0.56
	Per cent of total		7.9	17.1	1.3	8.9	10.5	1.2
94	Tampa, Fla.	1,733,871	120,303	358,355	28,846	208,797	183,443	150,585
	Per capita	20.33	1.41	4.20	0.34	2.45	2.15	1.77
	Per cent of total		6.9	20.7	1.7	12.0	10.6	8.7
95	Harrisburg, Pa.	2,234,723	121,616	280,129	28,153	227,924	229,102	4,000
	Per capita	26.79	1.46	3.35	0.34	2.73	2.75	0.05
	Per cent of total		5.4	12.5	1.3	10.2	10.3	0.2
96	Manchester, N. H.	2,230,548	136,436	521,822	85,709	220,914	295,219	56,856
	Per capita	26.84	1.64	6.27	1.03	2.66	3.56	0.68
	Per cent of total		6.1	23.4	3.8	9.9	13.2	2.5
97	Peoria, Ill.	2,168,141	167,071	418,705	95,896	137,572	192,782	251
	Per capita	26.58	2.05	5.13	1.18	1.69	2.36	[1]
	Per cent of total		7.7	19.3	4.4	6.3	8.9	[2]
98	South Bend, Ind.	2,416,161	91,872	533,669	42,657	86,267	143,663	25,000
	Per capita	30.17	1.15	6.66	0.53	1.08	1.79	0.31
	Per cent of total		3.8	22.1	1.8	3.6	5.9	1.0
99	Hamtramck, Mich.	1,714,688	159,063	364,515	36,641	255,264	50,618	76,732
	Per capita	21.78	2.02	4.63	0.47	3.24	0.64	0.97
	Per cent of total		9.3	21.3	2.1	14.9	2.9	4.5
100	St. Joseph, Mo.	1,870,267	115,445	465,243	30,350	52,839	147,212	23,032
	Per capita	23.88	1.47	5.94	0.39	0.67	1.88	0.29
	Per cent of total		6.2	24.9	1.6	2.8	7.9	1.2
101	Wilkes-Barre, Pa.	2,065,757	145,131	381,750	34,204	137,903	247,749	2,000
	Per capita	26.61	1.87	4.92	0.44	1.78	3.19	0.03
	Per cent of total		7.0	18.4	1.7	6.7	12.0	0.1
102	Gary, Ind.	2,392,902	145,347	444,952	39,639	90,697	129,802	.....
	Per capita	31.13	1.89	5.79	0.52	1.18	1.69	.....
	Per cent of total		6.1	18.6	1.7	3.8	5.4	.....
103	Rockford, Ill.	2,003,918	106,613	376,305	55,899	86,788	229,447	8,502
	Per capita	26.21	1.39	4.92	0.73	1.14	3.00	0.11
	Per cent of total		5.3	18.8	2.8	4.3	11.4	0.4
104	Sioux City, Iowa	2,148,537	90,042	355,857	22,437	147,345	116,597	1,562
	Per capita	28.21	1.18	4.67	0.29	1.93	1.54	0.02
	Per cent of total		4.2	16.6	1.0	6.9	5.5	0.1
105	Portland, Me.	2,659,476	142,911	524,259	29,780	163,876	478,372	178,446
	Per capita	35.30	1.90	6.96	0.40	2.18	6.35	2.37
	Per cent of total		5.4	19.7	1.1	6.2	18.0	6.7
106	Little Rock, Ark.	1,373,914	102,023	294,672	37,521	42,449	147,173	103,113
	Per capita	18.51	1.37	3.98	0.51	0.57	1.98	1.39
	Per cent of total		7.4	21.5	2.7	3.1	10.7	7.5
107	Charleston, S. C.	1,525,361	73,612	452,541	33,012	120,047	96,351	189,195
	Per capita	20.86	1.01	6.19	0.45	1.64	1.32	2.59
	Per cent of total		4.8	29.6	2.2	7.9	6.3	12.4
108	Sacramento, Calif.	3,213,150	196,071	674,718	57,487	282,128	164,754	33,749
	Per capita	44.47	2.71	9.34	0.80	3.90	2.28	0.47
	Per cent of total		6.1	21.1	1.8	8.8	5.1	1.1
109	Troy, N. Y.	2,532,030	183,845	618,980	39,050	231,122	186,280	264,855
	Per capita	35.06	2.55	8.57	0.54	3.20	2.58	3.67
	Per cent of total		7.3	24.4	1.5	9.1	7.3	10.5

[1] Less than one-half of 1 per cent. [2] Less than one-twentieth of 1 per cent.

For similar figures for cities of over 100,000 population, see THE MUNICIPAL INDEX *for 1927.*

Statistics for places of from 30,000 to 50,000 population will be published in THE AMERICAN CITY *next month.*

GOVERNMENTAL-COST PAYMENTS, CONTINUED

Schools	Libraries	Recreation	Miscellaneous	Net Debt Total	Net Debt Per Capita	Per Capita Assessed Valuation for City Government	Per Capita Levy for All Purposes	Per Capita Levy for Government of City	Estimated Population
$1,025,761	$60,108	$107,888	$169,615	$1,613,000	$16.24	$1,054.95	$28.90	$25.54	99,313
10.33	0.61	1.09	1.71						
38.0	2.2	4.0	6.3						
1,319,582	84,952	91,162	57,279	4,555,028	46.55	2,232.54	45.77	31.14	97,846
13.49	0.87	0.93	0.59						
53.4	3.4	3.7	2.3						
742,943	32,333	132,172	145,437	9,391,339	98.10	827.32	49.99	32.35	95,733
7.76	0.34	1.38	1.52						
27.1	1.2	4.8	5.3						
758,607	28,270	19,031	28,131	12,507,915	132.16	1,184.61	37.55	24.88	94,639
8.02	0.30	0.20	0.30						
33.9	1.3	0.9	1.3						
1,003,966	78,574	137,201	53,482	3,960,524	42.31	1,375.60	39.50	27.37	93,601
10.73	0.84	1.47	0.57						
48.6	3.8	6.6	2.6						
1,316,895	44,443	72,066	156,763	5,373,568	57.48	1,380.43	38.65	32.26	93,494
14.09	0.48	0.77	1.68						
38.0	1.3	2.1	4.5						
366,991	28,624	53,191	99,104	6,510,700	37.70	800.67	26.83	17.79	93,134
3.94	0.31	0.57	1.06						
21.5	1.7	3.1	5.8						
1,600,874	35,000	64,694	191,898	7,898,122	85.11	1,900.92	52.19	42.08	92,801
17.25	0.38	0.70	2.07						
42.2	0.9	1.7	5.1						
859,632	18,157	44,096	56,369	3,984,654	43.24	845.14	26.52	22.31	92,151
9.33	0.20	0.48	0.61						
50.3	1.1	2.6	3.3						
1,216,485	24,063	124,696	14,663	5,069,040	56.70	1,270.11	37.73	30.39	89,400
13.61	0.27	1.39	0.16						
55.7	1.1	5.7	0.7						
1,656,332	39,417	58,411	146,038	9,847,711	110.94	1,719.25	65.87	45.95	88,767
18.66	0.44	0.66	1.65						
45.8	1.1	1.6	4.0						
1,714,044	94,039	235,677	81,176	12,984,490	147.31	1,783.01	64.00	43.32	88,144
19.45	1.07	2.67	0.92						
42.8	2.3	5.9	2.0						
534,338	26,904	60,454	61,836	7,983,376	93.62	569.05	37.50	21.26	85,277
6.27	0.32	0.71	0.73						
30.8	1.6	3.5	3.6						
1,154,151	20,000	67,384	102,264	6,582,443	78.91	1,000.58	38.02	32.02	83,422
13.84	0.24	0.81	1.23						
51.6	0.9	3.0	4.6						
784,228	40,434	44,498	44,432	5,289,136	63.65	1,391.85	39.87	33.15	83,097
9.44	0.49	0.54	0.53						
35.2	1.8	2.0	2.0						
942,557	37,065	121,318	54,924	1,033,112	12.67	533.61	39.22	30.26	81,564
11.56	0.45	1.49	0.67						
43.5	1.7	5.6	2.5						
1,276,726	61,542	126,439	28,326	5,120,813	63.94	2,206.87	56.05	40.05	80,091
15.94	0.77	1.58	0.35						
52.8	2.5	5.2	1.2						
695,235	11,299	2,640	62,681	4,404,917	55.96	1,411.75	35.79	28.94	78,721
8.83	0.14	0.03	0.80						
40.5	0.7	0.2	3.7						
884,954	41,085	64,726	45,381	2,925,246	37.36	1,011.98	34.32	25.46	78,303
11.30	0.52	0.83	0.58						
47.3	2.2	3.5	2.4						
951,484	.....	72,702	92,834	3,900,173	50.23	1,272.25	44.08	34.35	77,644
12.25	.....	0.94	1.20						
46.1	.....	3.5	4.5						
1,260,488	60,469	190,378	31,130	2,989,097	38.89	1,811.42	57.48	46.37	76,870
16.40	0.79	2.48	0.40						
52.7	2.5	8.0	1.3						
1,000,614	54,009	70,935	14,806	2,193,150	28.68	593.96	44.37	32.01	76,462
13.09	0.71	0.93	0.19						
49.9	2.7	3.5	0.7						
1,270,130	42,801	70,017	31,749	3,728,195	48.96	457.34	48.45	37.78	76,151
16.68	0.56	0.92	0.42						
59.1	2.0	3.3	1.5						
942,613	24,498	92,185	82,536	8,832,093	117.24	1,483.58	48.68	36.57	75,333
12.51	0.33	1.22	1.10						
35.4	0.9	3.5	3.1						
602,949	12,478	16,131	15,405	2,638,812	35.56	793.09	29.44	15.60	74,216
8.12	0.17	0.22	0.21						
43.9	0.9	1.2	1.1						
435,460	.....	45,910	79,233	8,641,756	118.18	332.34	32.93	21.95	73,125
5.96	.....	0.63	1.08						
28.5	.....	3.0	5.2						
1,517,328	36,526	189,780	60,609	12,328,077	170.61	1,318.09	58.61	36.84	72,260
21.00	0.51	2.63	0.84						
47.2	1.1	5.9	1.9						
803,849	16,000	40,323	147,726	6,319,352	87.50	912.50	42.02	33.85	72,225
11.13	0.22	0.56	2.05						
31.7	0.6	1.6	5.8						

GOVERNMENTAL-COST PAYMENTS FOR EXPENSES OF MUNICIPAL DEPARTMENTS: 1925

Group IV—Continued, Cities of 50,000 to 100,000	All General Departments	General Government	Protection to Person and Property	Conservation of Health	Sanitation	Highways	Charities, Hospitals and Corrections
110 Binghamton, N. Y.	2,725,495	139,851	468,265	36,002	164,610	238,909	350,705
Per capita	37.86	1.94	6.50	0.50	2.29	3.32	4.87
Per cent of total		5.1	17.2	1.3	6.0	8.7	12.9
111 Saginaw, Mich.	1,949,164	139,802	348,618	49,107	66,291	144,769	46,084
Per capita	27.26	1.95	4.88	0.69	0.93	2.02	0.64
Per cent of total		7.2	17.9	2.5	3.4	7.5	2.4
112 Johnstown, Pa.	1,958,430	112,346	311,453	34,260	113,895	274,134	708
Per capita	27.40	1.57	4.36	0.48	1.59	3.84	0.01
Per cent of total		5.7	15.8	1.7	5.8	14.0	*
113 East St. Louis, Ill.	1,396,821	120,471	301,740	9,287	50,224	140,453	.....
Per capita	19.56	1.69	4.22	0.13	0.70	1.96	.....
Per cent of total		8.6	21.7	0.7	3.6	10.0	.....
114 Terre Haute, Ind.	2,063,226	81,043	438,926	16,888	46,251	159,822	10,500
Per capita	29.03	1.14	6.18	0.24	0.65	2.25	0.15
Per cent of total		3.9	21.3	0.8	2.2	7.8	0.5
115 Pawtucket, R. I.	1,747,550	147,507	343,001	17,464	109,180	234,561	63,798
Per capita	24.97	2.11	4.90	0.25	1.56	3.35	0.91
Per cent of total		8.4	19.6	1.0	6.2	13.4	3.7
116 Highland Park, Mich.	2,996,618	150,001	518,161	53,452	146,806	359,151	364,310
Per capita	42.84	2.14	7.41	0.76	2.10	5.14	5.21
Per cent of total		5.0	17.3	1.8	4.9	12.0	12.2
117 Lansing, Mich.	1,930,909	139,444	330,382	32,589	162,396	165,488	43,602
Per capita	27.93	2.02	4.78	0.47	2.35	2.40	0.63
Per cent of total		7.2	17.2	1.7	8.4	8.6	2.3
118 Passaic, N. J.	2,578,493	144,222	570,596	49,723	278,565	193,802	67,647
Per capita	37.38	2.09	8.27	0.72	4.04	2.81	0.98
Per cent of total		5.6	22.1	1.9	10.8	7.5	2.6
119 Springfield, Ohio.	1,351,665	88,418	172,815	19,423	11,540	160,440	143,425
Per capita	19.67	1.29	2.51	0.28	0.17	2.33	2.09
Per cent of total		6.5	12.8	1.4	0.9	11.9	10.6
120 Chester, Pa.	1,240,848	77,124	184,231	13,888	64,482	99,310	12,349
Per capita	18.11	1.13	2.68	0.20	0.94	1.45	0.18
Per cent of total		6.2	14.8	1.1	5.2	8.0	1.0
121 Hoboken, N. J.	3,275,683	221,357	928,201	47,000	247,540	90,053	52,454
Per capita	48.05	3.25	13.62	0.69	3.63	1.32	0.77
Per cent of total		6.8	28.4	1.4	7.6	2.7	1.6
122 Racine, Wis.	1,621,185	91,625	257,985	39,856	55,644	133,574	24,057
Per capita	23.94	1.35	3.81	0.59	0.82	1.97	0.36
Per cent of total		5.7	15.9	2.5	3.4	8.3	1.5
123 Winston-Salem, N. C.	1,296,920	58,052	242,377	43,198	99,141	90,259	143,735
Per capita	19.37	0.87	3.62	0.65	1.48	1.35	2.15
Per cent of total		4.5	18.6	3.3	7.6	7.0	11.1
124 New Britain, Conn.	1,948,350	127,789	350,328	52,853	103,154	193,106	89,746
Per capita	29.15	1.91	5.25	0.79	1.54	2.89	1.34
Per cent of total		6.6	18.0	2.7	5.3	9.9	4.6
125 Chattanooga, Tenn.	1,417,154	84,779	379,616	39,805	57,990	124,677	181,188
Per capita	21.34	1.28	5.72	0.60	0.87	1.88	2.73
Per cent of total		6.0	25.8	2.8	4.1	8.8	12.8
126 Altoona, Pa.	1,361,144	$1,542	204,215	16,931	43,159	149,438	3,275
Per capita	20.58	1.23	3.08	0.26	0.65	2.26	0.05
Per cent of total		6.0	14.9	1.2	3.2	11.0	0.2
127 Mobile, Ala.	1,134,015	83,283	270,105	28,957	72,261	106,946	47,952
Per capita	17.25	1.27	4.11	0.44	1.10	1.63	0.73
Per cent of total		7.3	23.9	2.6	6.4	9.5	4.2
128 Berkeley, Calif.	2,342,222	110,059	373,544	36,824	125,579	177,529	27,747
Per capita	35.81	1.68	5.72	0.56	1.92	2.71	0.42
Per cent of total		4.7	15.9	1.6	5.4	7.5	1.2
129 Brockton, Mass.	2,384,364	124,838	484,366	92,976	197,080	251,176	162,887
Per capita	36.51	1.91	7.41	1.42	3.02	3.84	2.49
Per cent of total		5.2	20.4	3.9	8.3	10.6	6.8
130 Springfield, Ill.	1,573,166	137,237	313,010	21,500	67,287	79,842	12,805
Per capita	25.03	2.18	4.98	0.34	1.07	1.27	0.20
Per cent of total		8.7	19.9	1.4	4.3	5.1	0.8
131 Bethlehem, Pa.	1,264,159	105,713	151,054	13,887	40,473	127,042	2,800
Per capita	20.12	1.68	2.41	0.22	0.64	2.02	0.04
Per cent of total		8.4	12.0	1.1	3.2	10.1	0.2
132 Huntington, W. Va.	1,631,131	82,951	323,037	16,774	89,453	87,564	28,717
Per capita	26.06	1.33	5.16	0.27	1.43	1.40	0.46
Per cent of total		5.1	19.7	1.0	5.5	5.4	1.8
133 Cicero, Ill.	1,399,166	125,090	229,073	27,309	133,078	125,136	3,924
Per capita	22.48	2.01	3.68	0.44	2.14	2.01	0.06
Per cent of total		8.9	16.3	2.0	9.5	8.9	0.3
134 Quincy, Mass.	2,487,384	145,182	451,231	66,150	174,939	328,328	180,868
Per capita	41.02	2.39	7.44	1.09	2.89	5.41	3.13
Per cent of total		5.8	18.1	2.7	7.0	13.2	7.6
135 Lincoln, Nebr.	1,620,547	126,707	224,924	51,025	65,084	51,068	24,870
Per capita	26.75	2.09	3.71	0.84	1.07	0.84	0.41
Per cent of total		7.8	13.8	3.1	4.0	3.2	1.5
136 Holyoke, Mass.	2,516,105	141,467	551,961	122,304	202,328	231,430	182,626
Per capita	41.70	2.34	9.14	2.03	3.35	3.84	3.03
Per cent of total		5.6	22.0	4.9	8.0	9.2	7.3
137 East Orange, N. J.	2,071,159	105,818	446,551	40,289	197,063	188,592	25,441
Per capita	34.54	1.76	7.44	0.67	3.29	3.15	0.42
Per cent of total		5.1	21.6	1.9	9.5	9.1	1.2
138 Portsmouth, Va.	974,464	101,037	199,265	37,226	80,472	110,899	22,964
Per capita	16.51	1.71	3.38	0.63	1.36	1.88	0.39
Per cent of total		10.4	20.5	3.8	8.3	11.3	2.4
139 Covington, Ky.	1,130,891	116,398	257,615	12,352	125,300	213,034	16,103
Per capita	19.39	2.00	4.43	0.21	2.15	3.66	0.28
Per cent of total		10.3	22.8	1.1	11.1	18.8	1.4
140 Macon, Ga.	1,211,688	53,395	311,146	65,214	81,142	106,040	157,653
Per capita	20.81	0.92	5.34	1.12	1.39	1.82	2.71
Per cent of total		4.4	25.7	5.4	6.7	8.7	13.0

* Less than one-twentieth of 1 per cent.

GOVERNMENTAL-COST PAYMENTS, CONTINUED

Schools	Libraries	Recreation	Miscellaneous	Net Debt Total	Net Debt Per Capita	Per Capita Valuation for City Government	Per Levy for All Purposes	Per Levy for Government of City	Estimated Population
1,091,683	22,523	39,559	173,388	5,977,423	83.03	1,594.47	54.55	47.46	71,992
15.16	0.31	0.55	2.41						
40.1	0.8	1.5	6.4						
1,063,223	41,642	24,718	24,910	3,573,652	49.97	1,238.53	43.61	31.76	71,513
14.87	0.58	0.35	0.35						
54.5	2.1	1.3	1.3						
1,007,201	.....	27,241	77,192	6,312,694	88.32	1,094.61	38.83	32.57	71,475
14.09	.....	0.38	1.08						
51.4	.....	1.4	3.9						
668,635	14,896	65,901	25,214	2,327,841	32.59	357.36	33.63	22.55	71,423
9.36	0.21	0.92	0.35						
47.9	1.1	4.7	1.8						
1,094,293	44,811	105,148	65,544	2,360,767	33.22	1,248.19	43.06	30.64	71,071
15.40	0.63	1.48	0.92						
53.0	2.2	5.1	3.2						
733,729	22,860	33,183	42,267	7,336,576	104.85	1,801.35	33.21	31.04	69,975
10.49	0.33	0.47	0.60						
42.0	1.3	1.9	2.4						
1,221,513	40,117	68,397	74,710	6,645,942	95.02	2,829.71	61.92	48.11	69,945
17.46	0.57	0.98	1.07						
40.8	1.3	2.3	2.5						
934,438	18,427	71,706	32,437	6,025,633	87.17	2,097.64	49.10	38.21	69,125
13.52	0.27	1.04	0.47						
48.4	1.0	3.7	1.7						
1,136,162	27,787	51,516	58,473	5,727,470	83.03	1,374.61	48.22	36.51	68,979
16.47	0.40	0.75	0.85						
44.1	1.1	2.0	2.3						
651,075	22,374	18,204	63,951	3,051,635	44.40	1,409.34	30.30	24.40	68,725
9.47	0.33	0.26	0.93						
48.2	1.7	1.3	4.7						
711,309	2,350	13,429	62,376	2,984,473	43.56	965.21	23.06	20.27	68,507
10.38	0.03	0.20	0.91						
57.3	0.2	1.1	5.0						
1,438,356	33,974	81,628	185,120	9,902,159	145.27	1,402.39	66.55	49.14	† 68,166
21.10	0.50	1.20	1.98						
43.9	1.0	2.5	4.1						
874,631	30,445	64,206	49,162	3,844,200	56.78	1,434.86	32.08	26.14	67,707
12.92	0.45	0.95	0.73						
54.0	1.9	4.0	3.0						
594,267	10,139	15,290	462	8,218,855	122.78	1,828.14	30.16	20.11	66,941
8.88	0.15	0.23	0.01						
45.8	0.8	1.2	*						
907,005	30,000	44,509	59,860	4,803,107	71.85	1,469.73	34.91	33.82	66,849
13.57	0.45	0.67	0.75						
46.6	1.5	2.3	2.6						
473,394	30,000	23,793	21,912	7,511,104	113.10	1,510.72	42.30	24.17	66,413
7.13	0.45	0.36	0.33						
33.4	2.1	1.7	1.5						
774,249	.....	13,306	75,029	3,347,471	50.61	1,008.12	24.66	19.66	66,148
11.70	.....	0.20	1.13						
56.9	.....	1.0	5.5						
468,420	1,100	31,892	23,099	4,056,542	61.71	724.12	24.62	14.48	65,735
7.13	0.02	0.49	0.35						
41.3	0.1	2.8	2.0						
1,328,445	61,928	86,734	13,833	3,197,904	48.89	1,182.22	43.50	30.75	65,405
20.31	0.95	1.33	0.21						
56.7	2.6	3.7	0.6						
909,482	28,852	28,951	103,756	3,851,572	58.97	1,086.93	42.38	37.75	65,316
13.92	0.44	0.44	1.59						
38.1	1.2	1.2	4.4						
793,825	30,227	95,157	22,276	1,603,829	25.52	469.94	35.48	28.53	62,841
12.63	0.48	1.51	0.35						
50.5	1.9	6.0	1.4						
722,661	31,969	13,041	55,519	6,482,433	103.18	972.10	29.31	24.30	62,828
11.50	0.51	0.21	0.88						
57.2	2.5	1.0	4.4						
959,724	20,784	19,705	2,422	2,198,520	35.12	1,980.94	39.02	29.71	62,592
15.33	0.33	0.31	0.04						
58.8	1.3	1.2	0.1						
723,198	13,772	7,417	11,169	1,250,172	20.09	215.23	28.84	23.81	62,238
11.62	0.22	0.12	0.18						
51.7	1.0	0.5	0.8						
875,366	33,219	141,835	81,266	3,415,000	56.32	1,800.37	48.62	44.04	60,634
14.44	0.55	2.34	1.34						
35.2	1.3	5.7	3.3						
976,599	28,858	58,461	12,951	3,252,711	53.70	1,687.80	42.16	36.41	60,577
16.12	0.48	0.97	0.21						
60.3	1.8	3.6	0.8						
892,153	33,683	64,167	93,986	4,091,601	67.81	1,923.72	44.25	37.63	60,340
14.79	0.56	1.06	1.56						
35.5	1.3	2.6	3.7						
921,054	51,305	44,856	50,190	4,078,430	68.01	1,574.08	52.03	35.92	59,967
15.36	0.86	0.75	0.84						
44.5	2.5	2.2	2.4						
380,117	3,000	17,264	22,220	8,360,682	141.64	757.39	17.51	15.36	59,029
6.44	0.05	0.29	0.38						
39.0	0.3	1.8	2.3						
340,750	11,120	18,630	19,589	2,768,303	47.48	766.29	25.44	19.16	58,309
5.84	0.19	0.32	0.34						
30.1	1.0	1.6	1.7						
378,215	7,319	27,713	23,851	2,631,024	45 18	815.59	28.69	18.64	58,237
6.49	0.13	0.48	0.41						
31.2	0.6	2.3	2.0						

* Less than one-twentieth of 1 per cent.

† Population as of Jan. 1, 1920.

GOVERNMENTAL-COST PAYMENTS FOR EXPENSES OF MUNICIPAL DEPARTMENTS: 1925

	Group IV—Continued. Cities of 50,000 to 100,000	All General Departments	General Government	Protection to Person and Property	Conservation of Health	Sanitation	Highways	Charities, Hospitals and Corrections
141	Roanoke, Va.	1,331,047	129,816	299,937	23,213	97,241	131,068	39,095
	Per capita	22.87	2.23	5.15	0.40	1.67	2.26	0.67
	Per cent of total		9.8	22.5	1.7	7.3	9.8	2.9
142	Jackson, Mich.	1,351,721	82,588	205,316	55,916	52,202	95,498	162,908
	Per capita	23.32	1.44	3.54	0.96	0.90	1.65	2.81
	Per cent of total		6.2	15.2	4.1	3.9	7.1	12.1
143	Shreveport, La.	1,387,356	107,116	343,932	42,216	136,097	138,057	25,765
	Per capita	23.98	1.85	5.94	0.73	2.35	2.39	0.45
	Per cent of total		7.7	24.8	3.0	9.8	10.0	1.9
144	Fresno, Calif.	2,130,481	102,955	571,735	32,869	60,242	134,214	6,434
	Per capita	36.98	1.79	9.93	0.57	1.05	2.33	0.11
	Per cent of total		4.8	26.9	1.5	2.8	6.3	0.3
145	Niagara Falls, N. Y.	2,264,960	181,652	399,563	65,939	205,033	185,731	21,202
	Per capita	39.65	3.18	7.00	1.15	3.59	3.26	0.37
	Per cent of total		8.0	17.6	2.9	9.1	8.2	0.9
146	Lakewood, Ohio	1,745,501	63,909	228,063	22,814	116,196	140,283	3,996
	Per capita	30.74	1.13	4.02	0.40	2.05	2.47	0.07
	Per cent of total		3.7	13.1	1.3	6.7	8.0	0.2
147	Lancaster, Pa.	1,016,880	37,158	158,129	10,140	68,183	160,796	2,633
	Per capita	18.00	0.66	2.79	0.18	1.21	2.85	0.05
	Per cent of total		3.7	15.5	1.0	6.7	15.8	0.3
148	Wheeling, W. Va.	1,558,498	91,050	327,928	23,828	84,577	123,744	5,486
	Per capita	27.73	1.62	5.84	0.42	1.50	2.20	0.10
	Per cent of total		5.8	21.0	1.5	5.4	7.9	0.4
149	Pasadena, Calif.	3,015,984	167,641	415,491	37,622	208,313	314,777	31,378
	Per capita	53.93	3.00	7.43	0.67	3.73	5.63	0.56
	Per cent of total		5.6	13.8	1.2	6.9	10.5	1.0
150	Topeka, Kans.	1,347,548	69,872	259,550	31,880	97,067	100,182	22,304
	Per capita	24.20	1.25	4.66	0.57	1.74	1.80	0.40
	Per cent of total		5.2	19.2	2.4	7.2	7.4	1.7
151	Wichita Falls, Tex.	740,292	77,424	125,741	10,552	33,530	64,046	6,149
	Per capita	†	†	†	†	†	†	†
	Per cent of total		10.5	17.0	1.4	4.5	8.7	0.8
152	Augusta, Ga.	1,489,162	66,919	315,088	15,497	69,069	151,825	254,051
	Per capita	26.96	1.21	5.71	0.28	1.25	2.75	4.60
	Per cent of total		4.5	21.2	1.0	4.6	10.2	17.1
153	Kalamazoo, Mich.	1,520,458	81,639	302,757	26,346	47,905	106,816	39,151
	Per capita	28.36	1.52	5.65	0.49	0.89	1.99	0.73
	Per cent of total		5.4	19.9	1.7	3.2	7.0	2.6
154	Newton, Mass.	2,825,035	164,252	477,029	44,033	215,937	436,094	40,029
	Per capita	52.97	3.08	8.94	0.83	4.05	8.18	0.75
	Per cent of total		5.8	16.8	1.6	7.6	15.4	1.4
155	Atlantic City, N. J.	4,526,332	281,479	1,352,700	96,078	434,473	334,059	124,548
	Per capita	84.94	5.28	25.39	1.80	8.15	6.27	2.34
	Per cent of total		6.2	29.9	2.1	9.6	7.4	2.8
156	Decatur, Ill.	1,017,383	69,336	155,720	12,374	22,211	66,778	3,250
	Per capita	19.12	1.30	2.93	0.23	0.42	1.25	0.06
	Per cent of total		6.8	15.3	1.2	2.2	6.6	0.3
157	Davenport, Iowa	1,613,180	95,250	306,564	19,153	83,123	116,971	.....
	Per capita	30.62	1.81	5.83	0.36	1.58	2.22	.....
	Per cent of total		5.9	19.0	1.2	5.2	7.3	.....
158	Charlotte, N. C.	1,204,335	88,938	253,041	48,173	109,247	125,571	9,245
	Per capita	22.91	1.69	4.82	0.92	2.08	2.39	0.18
	Per cent of total		7.4	21.0	4.0	9.1	10.4	0.8
159	Malden, Mass.	1,664,422	76,866	313,331	48,923	171,881	155,438	48,564
	Per capita	32.06	1.48	6.04	0.94	3.31	2.99	0.94
	Per cent of total		4.6	18.8	2.9	10.3	9.3	2.9
160	Oak Park, Ill.	1,528,619	65,646	208,378	27,584	112,321	126,191	1,800
	Per capita	29.73	1.28	4.05	0.54	2.18	2.45	0.04
	Per cent of total		4.3	13.7	1.8	7.3	8.2	0.1
161	Kenosha, Wis.	1,516,739	77,965	278,167	41,484	73,232	125,811	44,730
	Per capita	29.80	1.53	5.46	0.82	1.44	2.47	0.88
	Per cent of total		5.1	18.3	2.7	4.8	8.3	2.9
162	Hammond, Ind.	1,715,896	106,708	271,717	6,073	94,947	93,984	7,086
	Per capita	34.06	2.12	5.40	0.12	1.88	1.87	0.14
	Per cent of total		6.2	15.8	0.4	5.5	5.5	0.4
163	Mount Vernon, N. Y.	2,614,826	148,451	381,588	32,850	171,300	445,596	104,591
	Per capita	51.90	2.95	7.58	0.65	3.40	8.85	2.08
	Per cent of total		5.7	14.6	1.3	6.6	17.0	4.0
164	Cedar Rapids, Iowa	1,299,377	60,206	189,060	8,088	99,792	71,680	900
	Per capita	25.83	1.20	3.76	0.16	1.98	1.42	0.02
	Per cent of total		4.6	14.6	0.6	7.7	5.6	0.1

† Per capita not computed, population not estimated.

Rank in Population

according to the estimates of the Bureau of the Census for 1925 *is indicated by the numbers at the left of the city names.*

Statistics for the 81 *largest cities—those of over* 100,000 *population—are given in the* 1927 MUNICIPAL INDEX. *Similar statistics for places of* 30,000 *to* 50,000 *will be published in* THE AMERICAN CITY *next month.*

GOVERNMENTAL-COST PAYMENTS, CONTINUED

Schools	Libraries	Recreation	Miscellaneous	NET DEBT Total	NET DEBT Per Capita	Per Capita Valuation for City Government	Per Levy for All Purposes	Per Levy for Government of City	Estimated Population
565,577	14,301	13,542	17,257	5,695,129	97.84	1,258.86	26.18	21.89	58,208
9.72	0.25	0.23	0.30						
42.5	1.1	1.0	1.3						
609,501	20,415	45,913	20,374	4,039,592	69.68	1,404.54	36.02	23.72	57,972
10.51	0.35	0.79	0.35						
45.1	1.5	3.4	1.5						
506,892	10,944	50,909	25,428	6,270,238	108.37	1,869.91	54.95	28.30	57,857
8.76	0.19	0.88	0.44						
36.5	0.8	3.7	1.8						
1,104,703	.....	89,080	28,249	2,903,260	50.40	814.12	40.53	25.81	57,605
19.18	.....	1.55	0.49						
51.9	.....	4.2	1.3						
1,036,420	21,497	55,507	92,416	10,566,399	184.96	2,130.46	53.66	42.39	57,129
18.14	0.38	0.97	1.62						
45.8	0.9	2.5	4.1						
1,014,797	51,912	21,613	81,918	7,350,240	129.46	2,528.79	53.86	46.49	56,774
17.87	0.91	0.38	1.44						
58.1	3.0	1.2	4.7						
514,492	3,000	13,961	48,388	2,860,476	50.62	679.81	22.41	19.37	56,505
9.11	0.05	0.25	0.86						
50.6	0.3	1.4	4.8						
850,886	16,640	16,509	17,850	3,988,560	70.96	2,066.42	49.48	36.26	*56,208
15.14	0.30	0.29	0.32						
54.6	1.1	1.1	1.1						
1,477,980	76,659	233,315	52,808	9,681,543	173.13	2,343.31	78.80	59.21	55,920
26.43	1.37	4.17	0.94						
49.0	2.5	7.7	1.8						
681,979	13,225	46,904	24,585	1,449,602	26.04	1,493.87	45.68	34.67	55,678
12.25	0.24	0.84	0.44						
50.6	1.0	3.5	1.8						
377,662	8,408	36,492	288	8,247,710	†	†	†	†	
†	†	†	†						
51.0	1.1	4.9	‡						
534,106	325	20,324	61,958	3,111,561	56.32	925.35	35.55	26.10	55,245
9.67	0.01	0.37	1.12						
35.9	‡	1.4	4.2						
786,585	37,637	40,056	51,566	2,254,477	42.05	1,373.22	45.34	33.31	53,613
14.67	0.70	0.75	0.96						
51.7	2.5	2.6	3.4						
1,076,201	74,482	167,724	129,254	3,779,915	70.88	2,209.76	60.55	54.38	53,332
20.18	1.40	3.14	2.42						
38.1	2.6	5.9	4.6						
1,453,066	51,075	168,250	230,604	14,812,708	277.98	3,866.62	122.41	86.56	53,287
27.27	0.96	3.16	4.33						
32.1	1.1	3.7	5.1						
605,490	22,062	43,578	16,584	1,470,166	27.62	349.63	33.04	23.32	53,219
11.38	0.41	0.82	0.31						
59.5	2.2	4.3	1.6						
846,490	36,509	78,320	30,800	2,848,820	54.07	972.11	50.52	37.74	52,683
16.07	0.69	1.49	0.58						
52.5	2.3	4.9	1.9						
529,064	10,788	6,104	24,164	6,700,542	127.44	1,975.79	41.89	22.13	52,578
10.06	0.21	0.12	0.46						
43.9	0.9	0.5	2.0						
606,610	34,186	80,187	128,436	2,288,516	44.08	1,142.70	36.79	33.33	51,915
11.68	0.66	1.54	2.47						
36.4	2.1	4.8	7.7						
885,124	23,207	52,213	26,155	2,458,210	47.80	418.09	49.42	40.22	51,423
17.21	0.45	1.02	0.51						
57.9	1.5	3.4	1.7						
735,897	35,252	58,365	45,836	2,900,500	56.99	1,305.09	38.67	31.50	50,891
14.46	0.69	1.15	0.90						
48.5	2.3	3.8	3.0						
1,019,603	30,274	65,155	20,349	2,364,873	46.94	1,553.28	45.43	35.88	50,385
20.24	0.60	1.29	0.40						
59.4	1.8	3.8	1.2						
1,142,540	33,884	47,688	106,338	8,593,560	170.57	2,364.95	62.19	49.13	50,382
22.68	0.67	0.95	2.11						
43.7	1.3	1.8	4.1						
802,894	23,626	35,915	7,216	3,042,381	60.47	412.67	41.82	33.11	50,311
15.96	0.47	0.71	0.14						
61.8	1.8	2.8	0.6						

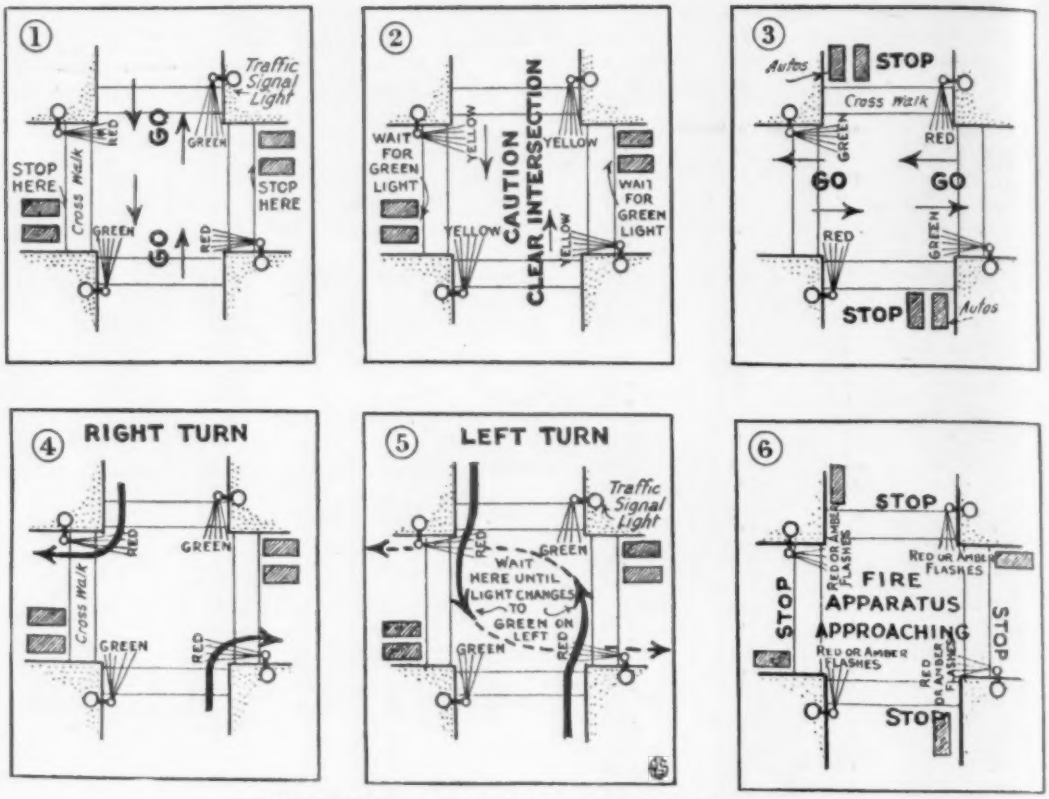
* Population as of Jan. 1, 1920.

† Per capita not computed, population not estimated.

‡ Less than one-twentieth of 1 per cent.

The Census Bureau's Classification

showing the various municipal activities and services included under the various classifications in the foregoing table will be found in THE MUNICIPAL INDEX *for 1927, page 104. Averages of total, per capita, and percentage expenditures for the main subdivisions of governmental-cost payments of the five groups of cities are given on page 97 of the same volume.*



TRAFFIC CONTROL BY SIGNALS IN WASHINGTON, D. C.

Experience with Progressive Traffic Control, Amber Lights, Right and Left Turns, and Fire Signals

By M. O. Eldridge

Director of Traffic of the District of Columbia

SYNCHRONIZED traffic signals whereby all lights on a main artery of travel showed "green" for a given period, then "red," were originally thought to produce the best results. Modern practice, however, has a tendency to abandon this form of control in favor of the progressive or coordinated system, whereby a vehicle traveling on a main street gets a change of signal at each cross-street and is then able to proceed the full length of the controlled section at a predetermined rate of speed without a stop.

Under the old synchronized system the timing on the main street was necessarily long, in order that traffic might move as far as possible before a change of signals brought it to a halt. The progressive and coordinated systems are operated on a much shorter timing, 30 to 45 seconds usually being sufficient. This results in fewer vehicles being caught in a block when the red light shows, and leaves space for parked vehicles to pull out or for others to get to the curb. With the synchronized system no speed control was possible except by motorcycle police, while with the more modern type mentioned the timing can be set to permit any desired speed.*

Synchronized Systems Easily Changed to Progressive Type

For those cities already equipped with synchronized systems, it might be of interest to note that such systems are easily changed over to the progressive type of operation at no other expense than a few hours' labor. This can

* For an illustrated description of the progressive system as operated on Sixteenth Street, Washington, see THE AMERICAN CITY for May, 1926, page 553.

best be done at night when traffic is lightest, and is accomplished by the simple means of reversing red and green lenses on alternate signals or on alternate groups of signals, so as to obtain a run of a length to produce the desired average speed.

In Washington, where the length of the blocks varies from 250 to 1,000 feet, it was necessary to group the lights singly or in groups of two or in groups of three intersections, depending upon the length of the blocks.

A traffic officer is needed to control the intersection at which the change is being made only while the work of changing the lenses is under way, and this officer can accompany the gang from street to street until the whole is completed. After the change is effected, the lights should be carefully watched, and the controlled section should be frequently run by an official car for a few days, until the proper timing and any additional signal lens changes have been determined. When all is operating in a satisfactory manner, the wire terminals in the signals should be reversed where lenses have been changed, and the lenses should be replaced, so that the colors on all signals will be in the same relative positions as an aid to color-blind drivers.

Coordinated signals are more flexible than those installed for progressive operation, but it is doubtful if this additional flexibility warrants the added expense. Coordinated control permits a variation in timing at each separate intersection and is undoubtedly ideal if expense is no object. Coordinated control apparatus is, however, expensive and delicate and the variation desired at the different intersections is usually so slight that the additional cost of apparatus and cable is generally unwarranted. This extra cost for cable is apt to be considerable, as it is necessary to run separate cables from each intersection to the control apparatus.

The Amber Light, Pro and Con

There is much difference of opinion as regards the use of an amber light in addition to the red and green lights. Our experience in Washington has, so far, led to the conclusion that the use of an amber light is necessary in order that a maximum of safety may be afforded to the pedestrian, and the intersection cleared of moving traffic. It is apparent, however, that the use of the amber light is a subject that merits the careful consideration of all traffic engineers.

The amber signal is not a "Stop" signal; neither is it a "Go" signal. Its purpose is to warn moving traffic that the "Go" period is almost over and a "Stop" signal will be flashed in five seconds. Drivers who are within 50 or 60 feet of an intersection have ample time to continue crossing the intersection and be out of the way before the direction of the traffic changes, while drivers who are farther back from the crosswalk have plenty of time to bring their cars to a gradual stop without suddenly jamming on their brakes and possibly causing the following vehicle to collide with them.

On the other hand, the use of the amber light after the red is not justified, because standing traffic has no need of a warning that the signal is about to change. Experience has shown that where this warning is given by flashing the amber light after a red light, standing traffic is apt to anticipate the green light and start too soon, thus endangering the vehicles that have not at that time finished clearing the intersection.

The ideal traffic cycle might possibly consist of a green light displayed for a predetermined number of seconds, followed by an amber light displayed for five seconds, followed by a red light displayed for the desired length of time, followed by a green light.

Right and Left Turns

There seems to be little uniformity in the method of making right- and left-hand turns in the different cities. Right-hand turns are always dangerous, because vehicles are obliged to pass over two crosswalks and necessarily cut through the line of pedestrians walking with the proper signal. In Washington, all right turns are made when confronted by a green light, in order that the turning vehicles shall not encounter a line of moving traffic.

Left turns are less dangerous, because they can be controlled and the vehicle only passes over one crosswalk and at a time when no pedestrian has a right to be there. They should, however, be eliminated whenever possible at intersections where two-way traffic is permitted on both streets, as under this condition they tend to cause congestion.

The driver desiring to make a left turn in Washington pulls into the intersecting street when the light confronting him is green, keeping as far to the right as possible. He then stops alongside the crosswalk in such a manner as to block traffic on the intersecting street, leaving ample space for through traffic to pass on his left. When the signal changes, the turn is completed. This method of making the left turn on streets controlled by traffic lights has proved to be eminently satisfactory.

At points where a two-way street intersects a one-way street, the driver wishing to make a left-hand turn stops at the right-hand curb,

just back of the crosswalk line, and when the signal changes to red, stopping through traffic on the two-way street, the turn is completed. Vehicles moving on the one-way street make the left-hand turn into the two-way street when running on a green signal.

Traffic Signals for Fire Apparatus

The signal system in Washington is divided into different zones, and the controlling apparatus in each zone is installed in a conveniently located fire-engine house. At each of these controlling points an operator is continually on watch whose duty it is to operate the fire signal, and in case of emergency to throw the switch, changing the control from automatic to manual, and then to operate the signal by the manual control while the emergency exists.

The Washington fire signal consists of an amber and a red light displayed simultaneously in all directions. This is a flashing signal operated at approximately 30 flashes per minute, and all traffic is required to clear the intersections and come to a standstill while the signal is on. The length of time that this signal is displayed depends entirely upon what fire apparatus is using the streets, and varies from 45 seconds to 3 minutes. The operators are furnished with a list of fire-alarm boxes which call for a display of the signal, together with the length of time that the signal should be operated for each box. The Chief of the Fire Department reports that the use of this signal has been of great benefit to the movement of fire apparatus.

Electric traffic signals have come to stay. Their usefulness and efficiency have been clearly demonstrated, and there is no question whatever that they are a vital factor in the reduction of traffic accidents.

Excerpts from a paper read before the City Planning Division of the American Society of Civil Engineers, in New York, January 20, 1927.

Four of New Jersey's Five Largest Cities Had Fewer Deaths from Automobiles in 1926 Than in 1925

POINTING out that the U. S. Census Bureau statistics show the cities of Newark, Jersey City, Trenton, and Paterson to have had fewer deaths from automobile accidents last year than during 1925, Sidney J. Williams, Director, Public Safety Division, National Safety Council, speaking on February 9 before the New Jersey Conference on Street and Highway Safety, said:

"How did these four cities do it? Was it by engineering improvements, better laws, better enforcement, publicity, safety work in the schools? The detailed story would be too long even if I knew it. But I do know this: In three of the four—Newark, Paterson, and Jersey City—the citizens and the public officials are banded together in a Community Safety Council through which, in addition to their individual functions and efforts, they have been making a determined and continuous effort for safety. And certainly the figures demonstrate that they have succeeded. In 1926 Paterson showed a reduction of about 40 per cent; Jersey City, 33 per cent, and the whole of Hudson County (covered by the same Safety Council) about 30 per cent; Newark, 6 per cent. Newark in addition enjoys the distinction of having shown a decrease for three successive years. Only six cities in the United States, and no others in New Jersey, showed such a reduction for *two* successive years, according to the report of the Hoover Conference. At least three of the six fell by the wayside last year, but Newark remained as one of three large American cities which, for the third consecutive year, has cut down its automobile accident toll. Such records do not come from luck, but only from the hardest kind of hard work and the determination that does not know when to quit. I esteem it an honor to make public acknowledgment here this morning of the obligation of the National Safety Council and all the people of the United States, to the public officials and the people and the Safety Council of Newark for this impressive demonstration that accidents on the streets and highways, no less than in the industries, *can be prevented*, not only for one month or one year, but for three years in succession; and likewise to Paterson and to Jersey City for their splendid reductions, and finally to Trenton, of whose activities I know less, but whose reduction of 10 per cent in 1926 speaks for itself.

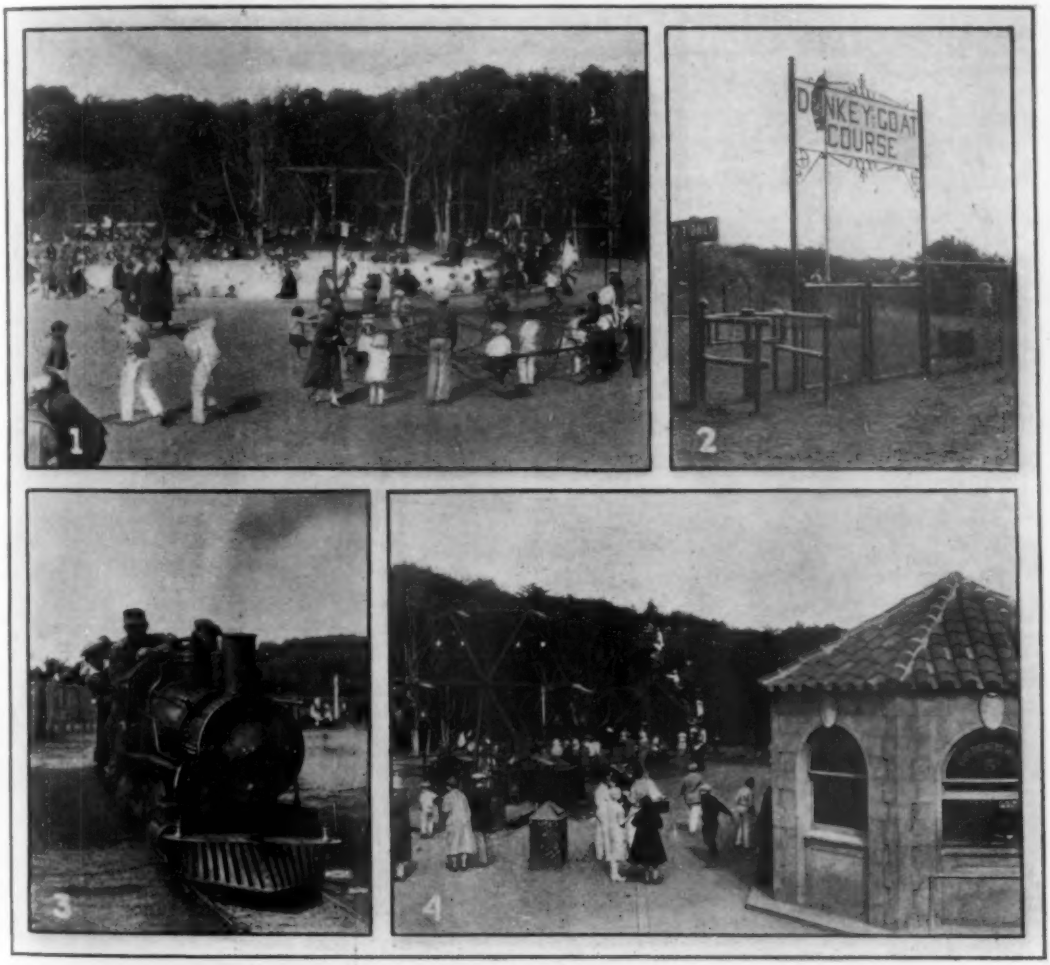
"I have referred to the fact that three of these cities—and I think it may be said, without disparagement of any other, the three that have made the most striking records—are each the home of an active safety council. I do not wish to claim credit for these reductions, for the safety councils in any narrow sense. A safety council is no more and no less than the coordinated will and energy of the community. Deaths were not reduced by 30 or 40 per cent in Paterson and Hudson County, and by smaller but consistent percentages in Newark for three successive years because there was an office with "Safety Council" on the door, a letterhead with some names on it, a paid manager, and a couple of assistants. The reason these accidents were prevented is because the leaders of the community—the public officials, the business men, and other forward-looking citizens—had determined to prevent them. The Safety Council was partly the cause, but chiefly the result of that determination; the medium through which that will expressed itself, in mobilizing public opinion to support the public officials in the performance of their duties, to sell the people of the community on the need for proper laws and enforcement and engineering improvements, and gradually and patiently to penetrate the consciousness of every man, woman, and child with the safety message of personal carefulness in the use of the streets."

Mothers, as Well as Children, Have Special Consideration in These San Francisco Playgrounds

Fleishhacker Playground Almost a Children's Fairyland

SAN FRANCISCO, CALIF.—At the Fleishhacker playground, recently completed in San Francisco, flying machines, miniature trains, a merry-go-round, a Ferris wheel, slides, swings, wading pool, sand-box, and many other devices have been installed to gladden children's hearts, while mothers relax in a rest hall built by Herbert and M. I. Fleishhacker in memory of their mother, Mrs. Delia Fleishhacker. This rest hall makes it easy for a mother with a large family to spend the day at the park, free from worry. The hall has nursery rooms, a huge lounge, with "comfy" chairs and a feeling of luxury and peace, and an artistic tea room.

In the playground are a wading pool, double slides, and triple slides, with all manner of bumps and turns. The sand-box is an immense circular affair filled with clean, white sand. The canvas swings for the very little children are so constructed that it is impossible to fall from them. The Ferris wheel has little cages from which it is impossible for a child to fall or become injured. The miniature train with a real steam engine seats 48 children. Up a hill and round a curve, down a hill, through a grove of trees, and back to the station it goes. The course is enclosed with a high fence, so "all speed ahead" is safe.



FUN FOR THE CHILDREN IN THE FLEISHHACKER PLAYGROUND, SAN FRANCISCO

1.—Immense sand-box and other playground equipment. 2.—Donkey and goat course. 3.—Miniature train. 4.—Booth where tickets are sold (at 5 cents each) for the Ferris wheel (shown at left), the miniature train, and the donkey ride

There is also a very popular donkey and goat course where children may ride these animals.

This unique playfield is located at Sloat Boulevard and the Great Highway near the municipal swimming pool, and is down in a sheltered sunny hollow. It covers 60 acres of ground, bought by the city from the Spring Valley Water Company for $240,000. At the suggestion of Mayor James Rolph, the Board of Park Commission named the field Fleishhacker Playground, in honor of the donors of the rest hall for mothers.

C. W. GEIGER.

A Park Which Has Special Facilities for Children and Mothers

SAN FRANCISCO, CALIF.—Think of a city that has developed a three and-a-half mile stretch of beautiful outdoors in its very midst, no farther than across the street for many, and within a five-cent car fare for all. And think of the possibilities of turning children loose every day of the three hundred and sixty-five in a playground equipped for every sport you can think of. Paradise, did you say? No; just San Francisco's Golden Gate Park, planned by that magician, John McLaren, who made out of a stretch of sand dunes one of the finest parks in North America.

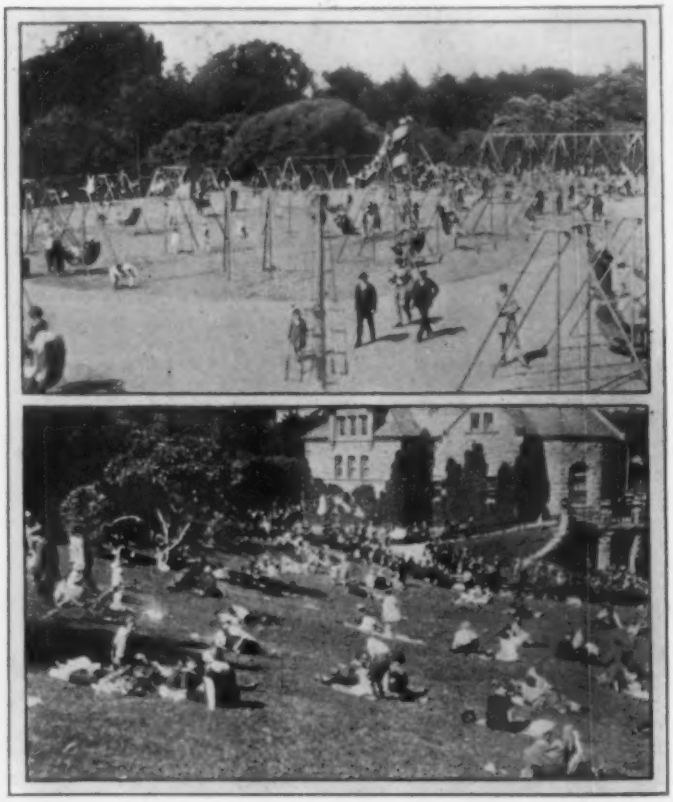
While Golden Gate Park provides for outdoor recreation for all ages and all tastes, its greatest service is to its future citizens. Any day from January to December, Christmas as well as Fourth of July, you can see them, regiments of babies, bouncing and gurgling in their carriages, drawn up in front of their mothers, who make this a chance to catch up on the family mending. On a fenced-in lawn, reserved especially for "mothers and young children," swarms of toddlers make you think of a school of porpoises as they twist and squirm and creep and roll on the turf, while mother sits by, happy in the knowledge that no one in the apartment below is going to complain of the noise overhead!

Just beyond this big open-air nursery the Children's Playground, or outdoor gymnasium, is alive with youngsters building muscle in a variety of activities, flying through the air in swings or on rings, climbing ladders both horizontal and upright, shooting safe chutes, hanging and "chinning" on the bars, riding in the merry-go-round, a free-for-all treat, or making the rounds of the shady donkey course at the generous terms of "two trips for a nickel." Part of the playground is kept exclusively for small boys' baseball. On shallow Spreckels Lake they may sail boats without throwing mother into a panic, or try their luck at fishin' or fly casting from safe piers built for their convenience.

When luncheon time comes round, dozens of family groups spread their sandwiches and cake out on the grass or on the rustic tables provided for the purpose. Warm milk and simple dishes for the youngsters and salad and coffee for the grown-ups are to be had in generous portions for a nominal price at the pretty stone house donated by a San Franciscan for the particular benefit of mothers and babies. A few neat little concerns supply "cones" for five cents that are fully as large as the regulation ten-centers, for it is the policy of these concessions to give you the most for your money; and anything above costs they turn in for park equipment.

When the fun is over, you will see family clean-up squads—usually under mother's supervision—gathering up papers and scraps and depositing them in the big green cans placed at frequent intervals behind leafy screens. Any litter that is overlooked is promptly taken care of by playground employees, so that the beauty of the park is always kept at the highest possible grade.

AGNES DANFORTH HEWES.



SCENES IN GOLDEN GATE PARK, SAN FRANCISCO
Playground equipment in the outdoor gymnasium—The lawn for mothers and children

The Swimming Pool Section of the 1927 MUNICIPAL INDEX

contains the most complete tabulation ever prepared of swimming pools in American cities and towns, and also presents the code of standards for the design, construction, equipment and operation of swimming pools formulated by the Joint Committee on Bathing Places of the Public Health Engineering Section of the American Public Health Association and of the Conference of State Sanitary Engineers.

Costs of Police Departments, Criminal Courts, and Correctional Institutions

Comparative Figures for 1925 and 1915 of Cities Having Population of Over 30,000

THE Department of Commerce announced on February 12 a summary of the expenditures for police departments in the 247 cities having a population of over 30,000 for the fiscal year 1925. The total population of these cities represents 35.3 per cent of the entire population of continental United States.

The large increases in the cost for police service, criminal courts, correctional institutions, and probation boards, as well as other financial data, are presented in comparable detail in the annual reports on financial statistics of the principal cities. The judicial cost is only partly represented in such costs of the city government, as criminal costs in superior courts are generally a charge upon the state or county governments, the exceptions being largely in the cities having a population of more than 300,000, where such cities exercise the ordinary functions of county governments, or where a per cent of the expenditures of the counties are included with those for the cities. There are a few states in which superior court costs are carried by the city government, but, in general, the payments are for municipal courts having supervision over violation of municipal ordinances only.

The costs for maintaining and operating the police departments, criminal courts, and correctional institutions, as nearly as they could be identified, amounted to $220,241,752, or a per capita of $5.41 for 247 cities in 1925, as compared with $94,869,986, or a per capita of $3.04 for 204 cities in 1915. These costs do not include the payments for outlays for improvements, nor the interest on bonds issued for construction and equipment of these departments.

Expenditures for	1925 (247 Cities) Operation and Maintenance	1925 (247 Cities) Per Capita Operation and Maintenance	1915 (204 Cities) Operation and Maintenance	1915 (204 Cities) Per Capita Operation and Maintenance
Police Departments..	$157,194,635	$3.86	$64,892,291	$2.08
Police Pensions.....	11,185,952	0.27	4,712,921	0.15
Probation Boards....	1,836,870	0.05	498,731	0.02
Judicial				
General Courts....	10,779,739	0.27	5,344,947	0.17
Coroner.....	711,715	0.02	494,843	0.02
Superior Courts*..	19,729,901	0.48	10,156,291	0.35
Marshal & Sheriff*.	4,454,148	0.11	1,956,069	0.06
Correctional Institutions				
Adults.....	10,245,708	0.25	5,420,285	0.17
Minors.....	4,103,084	0.10	1,393,608	0.04
Total.....	220,241,752	5.41	94,869,986	3.04

*Includes criminal and civil costs.

Operation and Maintenance of Police Departments

Payments for the operation and maintenance of the police service for 1925 amounted to $157,194,635, the cost per person in the 247 principal cities being $3.86. The expenditures for the department alone represented 10.3 per cent of the expenditures for maintenance and operation of all general departments of the cities, being next in importance to that for schools, which constituted 37.5 per cent of such expenditures. The general departments, as the term is here used, do not include public service enterprises, such as water-works, electric light plants, or similar public service utilities. For the year 1915 the payments for operation and maintenance of police departments for the 204 cities having a population of over 30,000 amounted to $64,892,291, or a per capita of $2.08. The increase in the per capita payments from 1915 to 1925 is due not only to increased compensation of policemen, but also to the increase in the number of those assigned to direction of traffic. The above amounts do not include payments of interest on bonds issued for financing permanent improvements or equipment of police department properties. Neither do they include payments for the maintenance of the police electrical equipment for those cities, 77 in number, which report such expenses as undistributed, under the heading, "Police and fire alarm system." The aggregate of such undistributed figures for 1925 was $2,080,303.

The cities, showing, respectively, the highest and lowest per capitas for maintenance and operation of police departments in 1925 were: for group I—Boston, Mass., $5.96, and Cleveland, Ohio, $3.41; for group II—Jersey City, N. J., $3.44, and Cincinnati, Ohio, $2.41; for group III—Yonkers, N. Y., $5.93, and Canton, Ohio, $1.48; for group IV—Atlantic City, N. J., $10.76, and Springfield, Ohio, $1.08; for group V—New Rochelle, N. Y., $6.24, and Hazleton, Pa., $0.92.

The per capita figures for Atlantic City are based on the estimated population, which represents only the number of permanent residents of the municipality. The city, must, however, make provision for a population greatly augmented by visitors and temporary residents. The municipality in group IV ranking next to Atlantic City in police department expenses was Hoboken, N. J., with a per capita of $6.97.

Police Department Property

For 1925 there was expended in outlays for permanent improvements for police department $6,136,654. This represented only 0.8 per cent of the total outlays for permanent improvements in all general departments. As shown by the following table, in all classes of cities the outlays for police departments formed a very small percentage of the total outlays; the percentage for 1925, however, was double

that for 1915. Buildings for police headquarters are often a part of the city hall, and outlay payments for such buildings are reported as for general government.

For the 247 cities having over 30,000 population in 1925, the total value of land, buildings, and equipment of all general departments amounted to $4,973,436,227. Of this total, $53,495,184, or 1.1 per cent, was for the police departments. In 1915 for the 204 cities in this class, the value of land, buildings, and equipment of general departments amounted to $2,376,491,410, of which $31,451,500, or 1.2 per cent, was for the police departments of the cities.

COMPARATIVE COST OF POLICE DEPARTMENTS FOR 247 CITIES IN 1925 AND 204 CITIES IN 1915

Year	Operation and Maintenance			Outlays for Permanent Improvements	
	Total	Per Capita	Per Cent of Total Payments for Expenses of General Departments	Total	Per Cent of Total Payments for Outlays of General Departments
	Grand Total				
1925 (247 cities)	$157,195,000	$3.86	10.3	$6,136,000	0.8
1915 (204 cities)	64,892,000	2.08	11.2	1,091,000	0.4
Group I.—Cities Having a Population of 500,000 and Over					
1925	91,471,000	5.13	11.4	4,466,000	1.1
1915	36,760,000	2.79	12.4	409,000	0.4
Group II.—Cities Having a Population of 300,000 to 500,000					
1925	17,424,000	3.95	9.5	459,000	0.6
1915	8,330,000	2.11	9.6	119,000	0.2
Group III.—Cities Having a Population of 100,000 to 300,000					
1925	26,510,000	2.81	9.5	569,000	0.4
1915	10,766,000	1.60	10.6	254,000	0.4
Group IV.—Cities Having a Population of 50,000 to 100,000					
1925	14,477,000	2.54	8.7	391,000	0.4
1915	5,411,000	1.30	10.0	126,000	0.5
Group V.—Cities Having a Population of 30,000 to 50,000					
1925	7,313,000	2.15	7.8	251,000	0.5
1915	3,625,000	1.15	9.0	183,000	0.8

Tests for Selecting Fire Lieutenants

By Fred Telford

THE results of investigations regarding methods of selecting fire fighters to be promoted to Fire Lieutenant, which have extended over more than a year, are described at some length in the January issue of *Public Personnel Studies,* which is published by the Bureau of Public Personnel Administration at Washington, D. C.

In conducting the investigations, a number of tests were arranged in tentative form and, with the cooperation of the Milwaukee Board of Police and Fire Examiners and the Baltimore City Service Commission, were given in considerable part to respective groups of 125 and 90 fire fighters, who actually competed in promotion tests. Following this experimental work, the material was considerably modified, revised, and rearranged; and on the basis of the data, three new sets of tests of approximately equal difficulty were developed for the use of examining boards who have to select the fire fighters to be promoted to Lieutenant.*

The nature of the tests and the relative weights of the various parts are indicated by the following outline:

Test Number	Test Name	Relative Weight	Time (Minutes)
1	Fire-fighting equipment, materials, and methods..... (Section A consists of 30 statements in the completion form each of which requires the competitor to write in a word or a phrase to supply missing information. Section B consists of 20 statements in the multiple choice form, from which the competitor chooses the best one. Section C consists of 100 statements in the true-false form; the competitor is to read each statement and indicate whether it is true or false.)	7	120
2	Understanding of literature relating to fire fighting..... (The competitor is required to answer with a word or a short phrase 10 questions as to the content and meaning of a printed selection placed in his hands and to indicate whether 20 statements relating to the content and meaning of a second selection are true or false.)		
3	Length of fire-fighting service..	½	...
4	Service (efficiency) rating.....	1½	...
5	Physical condition	1	...

Test 1, consisting of a total of 150 samples of information of the type of Fire Lieutenant needs, contains the main part of the written work. The material is in such form that the

* These tests, as now available, are in the form of mimeographed booklets which will be supplied to examiners by the Bureau of Public Personnel Administration at the approximate cost of paper, mimeographing, and shipping. A sample will be sent to any examiner or examining body for 20 cents in postage, and a copy of the magazine describing the tests can be obtained for 50 cents.

person tested indicates his answers either by writing a word or a phrase or simply by making a cross or encircling a letter. In both Milwaukee and Baltimore the success of this plan was evident, the men taking the tests much preferring to indicate their knowledge and judgment in this way, instead of writing what might be called "essays." About two hours is required for the written portions of the tests, while the papers of an individual can be scored in ten minutes or less.

The nature of the material in test 1 is indicated by the following excerpts from the three sections into which this test is divided:

SECTION A—COMPLETION STATEMENTS

Fill Each Blank So as to Make the Statement True and Complete

When hose is hung in towers, it should be supported by ..... coupling.

The first act of a company commander on arriving at another fire house which he has been ordered to cover is to .....

The maximum length of time that a wet cotton hose should be left on a wagon after a fire is .....

A charged length of hose hanging vertically must be supported every ..... feet.

Before breaking locked doors, fire fighters should first try to ..... them.

SECTION B—MULTIPLE CHOICE STATEMENTS

Indicate by a Cross (X) the Correct or Best Answer to Each Statement

The company commander first to arrive at the box when a false alarm has been turned in should:

———Immediately try to determine the cause of the alarm.

———Return to quarters with his company and report to headquarters that the alarm was false.

———Return to quarters with his company and report the case to the police department.

———Return to quarters with the company and detail one of his men to try to find out the cause of the alarm.

If a situation arises in the line of duty of a Fire Lieutenant which is not covered by rule, he should:

———Use his own judgment in the matter.

———Always refer the matter to a superior officer.

———Do as the majority of his men think best.

———Confer with an officer in his command.

If a fire fighter were ordered by a police officer on duty at a fire to enter a burning building, the fire fighter should:

———Refuse.

———Obey.

———Say he will carry out the order when he is ready to do so.

———Refer the matter to a Fire Captain or other superior officer of the Fire Department.

SECTION C—TRUE-FALSE STATEMENTS

Indicate by Encircling the T or F Whether You Consider Each Statement True or False

T F The officer who arrives first at a fire assumes command until the arrival of an officer superior to him.

T F In laying out hose, the hose wagon should keep to the hydrant side of the street.

T F Driving over charged hose does not injure it.

T F Snow must be removed from in front of the fire quarters to the center of the street.

T F Hose taken up after a fire should be uncoupled and placed on the wagon in short lengths.

T F A member of the Fire Department must wear his uniform at all times when he is on duty.

T F A company commander enters in his records all the fires in his district.

T F The adequacy of fire-escapes on buildings is determined by the company commander.

T F After placing the engine at a fire, the commanding officer directs his men to report to the seat of the fire.

T F All fire-engines must be given a special trial test at least once a month.

New Playground Awards Offered by Harmon Foundation

GROWING communities of 2,500 population or over are invited to present their claims to a $2,000 award by the Harmon Foundation of New York City for the purchase of a permanent playground, announces the Playground and Recreation Association of America, which will administer the awards.

Twenty-three playgrounds at a maximum cost of $2,000 each will be given by the Harmon Foundation in 1927, bringing to a total of 100 the recreation fields which this organization has helped to secure since 1922. Already 77 playgrounds have been established with the Foundation's aid, in 30 states.

Selection of the successful communities will be made upon individual merit in the order in which their claims are presented. The offer is not competitive.

The Eligibility of the Community

To be considered for an award, a community must show a growth of 30 per cent or more since 1900. Each town must have a permanent population of 2,500 or more at present. Rapidly growing suburbs where there are 2,500 or more within a radius of one mile of the proposed playground may apply. Evidence must be given of sufficient local enthusiasm in this offer to justify the contribution.

Two acres will be the minimum land area considered. Each site must be within play distance of the residence section by which it is to be used. The grounds should be substantially level, or provision made at the time of taking title for leveling, unless the tract is more than three acres.

Appropriations

Two thousand dollars is the maximum gift for each play field on the part of the Harmon Foundation, but there is no reason why this should not form part of a larger purchase if the balance of the excess cost is provided in advance and the other conditions of the offer are satisfactorily met. Not more than one contribution is made to any community. Towns or cities already provided with play fields secured through the assistance of the Harmon Foundation are not eligible for this offer.

Applications

All requests for the award must be made on an official blank obtainable from the Playground and Recreation Association of America, 315 Fourth Avenue, New York City. Complete information concerning the award and the steps to be taken in applying for it may be secured by writing to this address.

Chambers of commerce were the most numerous groups to respond to the announcement of a like award in 1924, according to the recreation association, which states that it believes the increasing interest in acquiring play areas before rise in property values makes such properties prohibitive in cost will this year stimulate a large response from such organizations.

Quantity Production of Concrete Sidewalks Cuts Costs

Saving of 33-1/3 Per Cent Effected in Hibbing, Minn.

WITH a 21-E paving mixer and a crew of seventeen men, E. W. Coons, a contractor in Hibbing, Minn., laid an average of 1,200 lineal feet of 6-foot concrete walk per day for the city during the last construction season. This was accomplished by applying to sidewalks the strike-off and tamping template and the finishing belt which have proved so effective for the quantity production of concrete pavements. These tools made a surface too coarse-grained for pedestrians until a second strike-off template which functioned much like a transverse float was used just ahead of the belt. Belts 8 and 10 inches wide were found better than 6- or 12-inch belts.

The concrete was mixed for a full minute and was kept as dry as possible by the requirement that it should not have a slump of more than 2 inches when tested with the standard cone.

The subgrade was sprinkled to prevent the absorption of mixing water, and the finished concrete was kept wet for four days to insure the complete hydration of the cement. Heavy wood forms dressed to 2¾ x 5 inches in size and braced at 10-foot intervals served as a guide for the template and a strike-off for the wooden straight edge just as in road building.

Batches were proportioned at a central plant where the aggregate was handled entirely by gravity. Bottom-dump cars of sand and pebbles were delivered on a trestle, and the materials were dropped into the bins beneath. The bin had sliding floors so that the aggregate ran

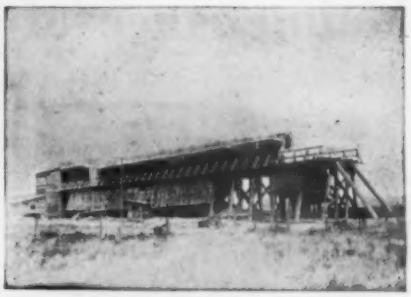
A 21-E mixer and a crew of 17 men laid 7 miles of one-course concrete walk in Hibbing the past season. The mixer ran 8 feet from the edge of the walk on unpaved streets and 9½ feet where the street was curbed. Forms were 3 by 6's, dressed to 2¾ by 5¼, staked and braced at 10-foot intervals

The concrete was finished with the same tools ordinarily used for pavements. It was first deposited to such a depth that it stood ½-inch above the forms, then struck off with a wooden straight edge, tamped with a similar template, floated with a wooden hand float, again struck off, then belted with two canvas belts

The earth subgrade was covered with a 5-inch layer of gravel, which was struck off, rolled, then struck off again with a wheeled template which ran on the forms and had a 5-inch cutting blade. The walks are 6 feet wide and 5 inches thick

The walk was divided into 6-foot blocks by metal plates 3/16-inch thick. These plates have notched ends which hook over the forms and slip into kerfs cut at 6-foot intervals. As soon as the surface is finished, the plates are lifted slightly to prevent adhesion of the concrete

After the concrete has hardened so that the sides of the cut will not flow together, the division plates are removed and the edges of the joints are rounded with a long-handled edger. Plates must be cleaned and oiled or the concrete may be lifted and cracked as the plate is pulled out



Five-sack batches of materials, proportioned 1 sack of cement to 2 feet of washed sand and 3½ feet of ¼- to 2-inch washed pebbles, were hauled from a central plant at which four men have unloaded and proportioned 100 carloads of material in a week without the aid of machinery

into the measuring chute and from there into trucks.

Bulk cement was used. It was transferred from box cars to the cement bin with scoops mounted on wheels much like a small hand truck. With these scoops two men working by contract regularly unloaded a car of cement in four hours.

Walks laid in the manner described above cost only two-thirds as much as those laid in the past on which smaller mixers, smaller crews, and less efficient methods were in use. This idea may well be applied to many municipal sidewalk jobs as well as concrete curb and gutter propositions, effecting considerable saving of taxpayers' money.

$543,000 for Additional Traffic Signal Lights Advocated in New York

A RECENT request of Police Commissioner George V. McLaughlin, of New York, for an appropriation of $543,000 to extend the traffic control signal light system in the boroughs of Manhattan, The Bronx, Brooklyn, and Queens, has met with strong endorsement by the Committee on Control of Street Traffic of The Merchants' Association of New York. In a report to the Board of Directors of that organization, dated January 17, 1927, the committee makes the following statements:

"Experience with the lights already installed shows that accidents are markedly reduced where this means of traffic control is used. It has also become clear that the installation of lights on some avenues immediately shifts the problem of effective traffic control to avenues not so lighted, which are sought by drivers who desire to avoid control. . . . .

"Installation of such signal lights is not only a sound measure for the promotion of safety, but also because it provides an orderly movement which, on congested avenues, materially speeds up traffic. Such a system also makes possible the synchronization of cross-traffic so that vehicles are not compelled to stop at one block to allow crosstown traffic to proceed and then stop again at the next block because the police officers at the intersections cannot coordinate their signals. . . . .

"While many of the important intersections are (and will continue to be) controlled by police officers, to provide them at all the crossings represented in the program presented by the Police Commissioner would require about 2,000 additional traffic men, or more than the present total traffic force."

Arizona Awake to the Need for Uniform Traffic Legislation

ACTIVITIES looking towards uniformity in motor vehicle control were reported from most of the forty-eight states in the December number of this magazine, in an article by A. B. Barber, Director, National Conference on Street and Highway Safety, entitled "How the States Are Working Towards a Uniform Motor Vehicle Code." The fact that Arizona was not included among the states reporting such activities has brought the following letter to THE AMERICAN CITY, under date of January 27, 1927, from C. L. Murphy, City Clerk of Winslow:

"I note in your December issue that no comprehensive plan for further traffic legislation tending toward a uniform traffic code was reported for Arizona.

"House Bill No. 11, known as 'A Uniform Motor Vehicle Act,' has been introduced into the House of Representatives by its Committee on Highways and Bridges.

"While I have not gone into the bill closely, it seems to follow the recommendations of the National Conference on Street and Highway Safety.

"House Bill No. 21, 'An Act Requiring All Motor-driven Vehicles to Come to a Complete Stop Before Crossing any Steam or Electric Railway Track in the State of Arizona; and Providing Punishment for Violation Thereof; etc.,' has also been introduced.

"I am giving you this information so that you will know that Arizona is wideawake to the need for uniform traffic legislation."

Maintenance of Distribution Systems

By Charles Haydock

THE distribution system of a water-works comprises about half of the physical inventory of the system. The real purpose of the distribution system is to supply plenty of water at a satisfactory pressure and to lose no more water than is absolutely necessary. The income of the water department or company is only for such water as passes consumers' meters, but all of the water which is delivered into the distribution system must be pumped, filtered, or processed in some way. A system which accounts in revenue for more than 80 per cent of the water leaving the dam or pumping-station is a reasonably tight system, and this is about comparable with the transmission losses of an electric power or a gas distribution system.

The water lost from a distribution system is a direct loss of profit, and water departments are justified in spending large sums of money to cut down such losses. At times, further increase in supply can be postponed by decreasing this loss of water, which is certainly a much cheaper proposition than building new dams, filter plants, or pipe lines.

The early development of every water system is largely dictated by expediency; that is, pipe lines are laid where consumers are located, and quite frequently, they are laid with a view simply to supplying those consumers, rather than under a comprehensive plan of development. As a result of this, it usually occurs that after a system is well established, it is confronted with the necessity of laying new trunk mains unless it is one of those more fortunate systems which are able to lay mains of a greater capacity than is required at the time they are built.

Leakage

After the distribution system has been laid, it is practically impossible to inspect it otherwise than to operate the valves and look for surface indications of leaks. Operating the valves is so simple that it is often neglected, and as a result valves fail to turn off the water when they are needed, because of leaky gates, dropped gates, bent or broken stems, etc. Anyone who has taken over an old, inadequately maintained system has had the experience of having to shut off many valves before the flow of water is decreased sufficiently to repair a break.

It is practically impossible to be too careful in the inspection and testing of new pipe lines. No ditch should be backfilled until every joint is just about right. Leakage quickly shows up in open country, but under many conditions the leak does not appear at the surface and escapes by other channels, and such leaks may continue for long periods before they are discovered. There are many cases where joint leaks or broken pipe leaks have entered sewers under paved streets and have been discovered only by chance in noting the larger quantity of sewage or the fact that it appeared to be clearer than normal. Creek and railroad crossings, particularly in porous fills or ballast and swampy ground, are also places to be watched carefully.

Water-Waste Surveys

Pitometer surveys are usually made only by the larger departments, but they are just as important for smaller communities. Every survey made has shown the presence of unknown leakage or consumption or both. In practically all cases, the value of this lost water has been sufficient to pay for the cost of the survey and the repairs in a short time. To make these surveys it is necessary that the distribution system be segregated into districts and that all of the water enter the district by one pipe line so that it can be measured. Studying the nature of the district and considering the variation in consumption throughout the twenty-four hours of the day will show whether there are any unusual conditions that require investigation. Practically every water-works has recording pressure gages in its pumping-station and keeps records of the water-levels in the various reservoirs. In many cases pressure gages are maintained in the offices. A few additional pressure gages scattered through the system will provide a valuable check of the general operating conditions and are always useful when complaints are made as to the character of the service.

District Meters

In many instances if meters have been installed at critical points in a distribution system, the excessive leakage and wastage so frequently found by Pitometer surveys would not have developed, because the gradual or sudden increase, as the case might have been, would have been noticed at once by the inspectors.

A liberal supply of valves at intersections is an economy in the long run because it makes it possible to give much better service when the inevitable difficulties arise which necessitate shutting down certain lines. The more valves there are, the fewer consumers will be out of water. As to fire-hydrants, it is good practice to place them no more than 500 feet apart, because this is the distance beyond which the insurance rates are penalized by the fire underwriters' inspectors on the ground of insufficient hydrants or requiring excessive length of hose.

Internal Pipe Line Conditions

Cast iron corrodes and tuberculates when acted upon by water, thus reducing the capacity of the pipe. If, as a result of forethought and financial resources, a main is laid of larger size than necessary for present consumption, the capacity of the main may be reached much sooner than was anticipated because the capacity is being reduced and the demand is increasing at the same time. This condition, perhaps, is not known to happen as frequently as it does, because it is difficult to demonstrate in some cases. It shows up most readily in the case of long mains with little service consumption from them, because such mains are usually the supply or transmission lines. This loss in capacity is not due to dirt or sediment in the pipe line in general, but is the result of the formation of tubercules of iron rust in the interior of the pipe.

Protecting New Pipe

There are three factors involved in the protection of new pipe—(1) the pipe metal, (2) the coating, (3) the water. The best solution of this question is the one which will maintain the carrying capacity at the least annual cost to the user of the pipe. No progress has been made recently in producing a more durable grade of cast iron in the volume and at the cost which is required by the cast iron pipe industry. This does not mean that such an iron never will be produced. The older water systems continually dig up cast iron pipe some of which shows practically no tuberculation, but it seems to be difficult to determine why this pipe has not corroded.

With regard to the coating, the possibilities are certainly great, and there has been much recent development along this line. Long transmission mains are now being laid of cement-lined pipe, and this should be a permanent protection of the carrying capacity so long as this lining adheres to the pipe. Cement lining of service pipe has been practiced for many years in New England and has been quite successful, so that if the cement lining is carefully applied to a cast iron pipe, there is no reason why it should not adhere for a long period.

Treating the water also has possibilities in some cases. The action of a highly corrosive water may be to corrode the pipe or cause rapid tuberculation, depending upon the exact nature of the corrosive properties. Where there is organic acidity in a very soft water, it might be expedient to remove this acidity by a small amount of sodium hydrate.

Pipe Cleaning

Protecting the pipe to be laid now and in the future does not help existing conditions at all. With reference to pipe lines that are now in the ground, we can do nothing for the quality of the material nor the coating. The only protection available is to treat the water to prevent tuberculation, and the only way to restore or maintain the carrying capacity of a pipe system is to lay new mains, pump the water, or clean the pipe lines. Laying new mains is required quickly enough, anyway, and the installation of pumps is a continual expense for fuel or electrical energy. In most instances cleaning pipe lines is the only method available for restoring their capacity and, where it can be done, the cost of restoring the capacity in this manner is always much less than by any other method.

ACKNOWLEDGMENT.—From a paper read before the Pennsylvania Water Works Association, at Atlantic City, N. J.

Recreation Facilities and Zoning Ordinances

THE PLAYGROUND, in its February issue, calls attention to a recent court decision in Washington, D. C., affecting the relationship of zoning regulations to recreation facilities:

"In November, 1926, an interesting situation arose in Washington, D. C., when the condemnation proceedings necessary to acquire property for an athletic field for Western High School, for which Congress had appropriated $125,000, were halted because of zoning regulations. The Supreme Court of the District of Columbia dismissed the proceedings on the ground that land sought to be condemned was in a district zoned as residential under the zoning laws.

"The Court of Appeals on January 3 reversed the judgment of the lower court and held that the athletic field was being acquired for the use of the high school, as a part of the educational institution and for educational purposes, which are permitted in residential zones. That is to say, the land was being condemned for a public use and could be so condemned without violating any zoning regulation. The land in question is not immediately contiguous to the school building, but several blocks distant.

"This decision will be of interest to other communities which may sometime be faced with a similar problem."

Tall Taxes for Tall Buildings

Shall a Super-Tax Be Imposed on Buildings of Undesirable Height or Cubage?—Comments on the New Principle in Municipal Taxation Suggested in Last Month's Issue by Albert S. Bard

Excessive Cubage Must Be Prevented, But Is Taxation the Answer?

To the Editor of THE AMERICAN CITY:

Mr. Bard's proposal that existing buildings which are higher than now allowed or than may hereafter be allowed shall bear a super-tax in proportion to their excess cubage is a proposal which naturally will appeal to many who believe that buildings of excessive cubage are detrimental.

I think it is undesirable to use the power of taxation for any purpose other than revenue. We have done that thing constantly in the United States and I believe with few exceptions the result has been bad.

If any act is invasive of the rights of others, such act should be prohibited. It is unfortunately true that we cannot now cut down the height of existing buildings. I do not see how it will make them any less of a nuisance to impose an extra tax upon them.

Mr. Ernest Flagg suggested that we should tax all buildings now or hereafter erected progressively in proportion to their height, the tax being well-nigh prohibitive when they reach a certain degree of undesirable height or undesirable cubage. I think Mr. Flagg does not object to height per se, and neither do I. What we object to is excessive cubage. It might have been well if one hundred years ago the city of New York had limited all buildings thereafter erected in business territory to 50 cubic feet for each square foot of land area and in multi-family districts to 30 cubic feet, and in territory where single-family houses should be erected to a much smaller proportion. We did not and we find ourselves in the position we are in. Some like it and some do not. I know of no practical way now to limit cubage in the districts of Manhattan Island except by a slight reduction at the building line, a reduction of the setback privilege on the street side, and a similar reduction on the rear and on the sides. I should even forego the reduction at the building line if we could get some reasonable reduction in the angle of setback front, rear, and on the sides.

There would be difficulties in writing a suitable statute to do what Mr. Bard proposes, and it is a question whether it might not conflict with the ad valorem principle. Our method of taxing real estate is to tax it in proportion to its value. To some extent the parcel of real estate which consists of a large plot improved with a high building is already taxed more than a small plot on which a high building cannot be erected. More and more plottage adds value in the borough of Manhattan. It is not uncommon now for a plot 100 feet wide to be worth more than five times as much as a plot 25 feet wide. Again, a high building that is yielding a satisfactory return on cost may be assessed at approximately cost, while an adjacent building no longer suited to the site should be assessed only for so much as it adds to the value of the land, and that may be only a nominal amount.

Before the war it was the exception that a building over ten stories high yielded a fair return. It is quite likely that the time will come when a building higher than that, which yields a fair return, will be the exception. Suppose we attempted to impose a supertax on a thirty-story building which did not pay, while we imposed a normal tax on a neighboring building five stories high, which did pay. How could we justify the classification? I do not think we could justify it from an economic point of view, and I have some doubt whether the Supreme Court of the United States would justify it under the 14th Amendment. It is true that they have approved classifications which were utterly unjustifiable, but we cannot expect them to do so indefinitely.

It is not long ago that the southeast corner of 57th Street and 5th Avenue was purchased for a large sum. It was rumored that a thirty-story building was to be erected. A five-story building stands on that site today. We may safely assume that the owner believed the five-story building would earn a larger return on the investment than a higher building. I think he was right. I hope he was. At all events he has not risked as much money in the experiment as if he had built thirty stories.

Near the same time the northwest corner of 52d Street and 5th Avenue was bought and again there was a rumor of a high building, and the building now standing on that site is four stories high. The man who did that was a public benefactor. I sincerely hope he makes money. I think he will.

LAWSON PURDY,

New York.

Advocates a Full Application of the Principle of Land Value Taxation

To the Editor of THE AMERICAN CITY:

I have read with interest the article by Mr. Albert S. Bard in your issue for February, favoring a special tax on exceptionally high buildings already constructed, in cases where height restrictions are introduced, limiting the height of buildings on neighboring lots. Mr. Bard's basic idea seems to be that when there is a special privilege enjoyed, and a special benefit conferred by the community, there should be a special tax. With this idea, if I have correctly interpreted it, I am in entire sympathy. Only it should be extended much farther than Mr. Bard has ventured, in his article, to suggest. For the principle involved is the principle of the bare-land-value or site-value tax.

If there is any one value that, above all others, is a measure of the contribution of the community as a whole, it is site value. It is the community—and easy access to all the benefits which the community contributes—that makes the lot in the center of a city worth so much more per year than the lot in the suburbs. The enjoyment of the privilege of doing business on this centrally-

located lot is the enjoyment of a privilege made by the community and the enjoyment of a benefit coming from the community. Therefore, if we really want to levy a special tax when there is a special privilege enjoyed and a special benefit conferred, we shall tax bare-land or site values much more heavily than improvement values, as is done, for example, to a considerable extent in the well-known Pittsburgh graded tax law. So far as high buildings are due to congestion, such a tax system tends to relieve the evil by forcing into use vacant land held for speculation and thus somewhat relieving the pressure on the land centrally located.

But the fact to which I would most especially call attention is that the full application of the principle of land-value taxation would automatically take care of such cases as Mr. Bard has in mind. For when height restrictions are applied to lots upon which high buildings have not yet been constructed, while they are waived for other lots upon which there already are high buildings, the annual value of the former lots at once becomes less than the annual value of the latter. The community's restriction on what may be done with the former makes their site value, i. e., their special privilege or benefit value, less. They would rent for less or sell for less. They would therefore, with fair appraisal, be taxed less, and if the city revenues are met chiefly by a bare-land-value or site-value tax, this difference in the annual charge on the two classes of lots would be very considerable. Mr. Bard's interesting suggestion certainly points to no modification of the principles of the site-value tax. On the contrary, it seems to conform to and to strengthen the authority of those principles. It is time that the principles in question received the serious consideration of other cities in the United States than Pittsburgh and Scranton, Pa.

HARRY GUNNISON BROWN,
Professor of Economics in the University of Missouri.
Columbia, Mo.

"Put a Taximeter on the Height of Buildings"

To the Editor of THE AMERICAN CITY:

That some form of special tax on tall buildings shall be adopted seems imperative from an analysis of the situation which confronts our large cities. No one can now say whether or not tall buildings are an economic necessity. The one sure way to test such a question is to make these buildings pay their fair share of the municipal expenses which their existence creates.

It is common usage to assess property for benefits of street opening and sewerage facilities. There remain, however, a mutiplicity of municipal expenses traceable directly to tall buildings which could not be so assessed with the advantage of precedent. Moreover, many of these expenses are continuing as from year to year, and others are annually increasing expenses which can be assessed only through the medium of an elastic tax rate, lest the remedy become worse than the disease.

It is quite natural to say that our present method of taxation is sufficiently elastic to take care of the situation through the valuation assessment, but is it? Unearned increment makes one lot as valuable as its next-door neighbor, yet on one lot there has been built a skyscraper and on the next lot a four-story building. The four-story building has been robbed of its light and otherwise injured, but the assessed valuation of the ground is perforce the same as for the skyscraper lot. In other words, the present system of taxation of real property has an elastic limit which has been exceeded, and the system is about to break from the load of unfairness placed upon it.

Under the existing taxation of real property, there can be little doubt that assessed valuations over the entire city are influenced by the intensive use of a small percentage of the area by tall structures. It would be multiplying difficulties to attempt to create taxing districts where different assessed values and rates would be used and, at the same time, only a part of the unfairness would be removed.

Put a taximeter on the height of buildings, so the further they go the more they pay; they will stop where the purse feels the pressure and economic equilibrium is reached.

M. W. WEIR.
New York.

Must Consider Height and Volume in Proper Relation

To the Editor of THE AMERICAN CITY:

There is a great deal of confusion in the public mind about height limitations, although there is a tendency now to consider height and volume in their proper relation. For example, Mr. Bard's proposal might be used in the 42d Street district in New York after a reduction in the present height limitations to tax those buildings already erected beyond the revised law. On the other hand, there are buildings of a much lesser height that have created an even greater evil by reason of their greater intensity of coverage; for example, the old-fashioned tenement house on the lower east side. Mr. Bard's proposal might be used for taxing the greater volume occupied by the present buildings after legislation has been enacted prohibiting such intensive coverage of the land for residential purposes.

The principle is, in my mind, a good one. It places the burden of bearing the cost of congestion where it should be placed—on those that, either through intensity of volume or height of construction, absorb a greater proportion of light, air, and municipal service such as streets, sewers, transportation, and what not, than the surrounding neighbors. Through a combination of taxation upon both volume and height, the greatest evil of all can be attacked, namely, the skyscraper which is built up in the air with narrow court spaces and without the necessary provision for light and air.

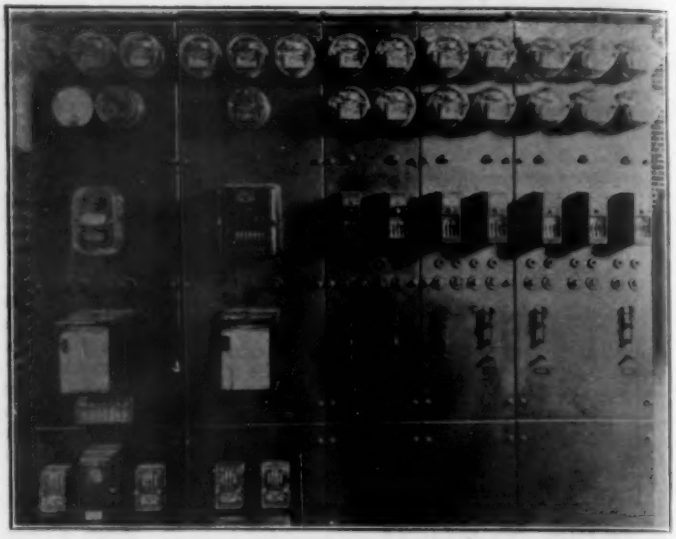
ARTHUR C. HOLDEN.
New York.

EDITORIAL NOTE.—*For the proposal of Albert S. Bard discussed in the foregoing letters, see* THE AMERICAN CITY *for February, 1927, page 157. See also article on "Skyscrapers," by Frederic A. Delano, in the issue for January, 1926 (obtainable in pamphlet form from the American Civic Association, Union Trust Building, Washington, D. C.).*

Protective Devices Assure Continuous Street Illumination in St. Louis

IN order to interrrupt the new electric street-lighting system of St. Louis, the first units of which were recently opened at Anne avenue, a great disaster would have to befall the generating equipment or the high-voltage transmission lines of the Union Electric Light and Power Company. The system is controlled from a number of substations similar to the Anne Avenue station, functioning automatically even to the point of turning the lights on and off at the correct time each day without manual control. The initial power source of the system is the Union Electric Company's 13,000-volt feeder lines, two of which enter the Anne Avenue Station. Two other stations are now under construction for use as the system is extended.

Contracts for the first section of the city's $8 000,000 street-lighting contract were let a year ago to A. M. Ryckoff, general contractor, St. Louis, Mo. The stations are equipped with automatic apparatus of special Westinghouse design.



ST. LOUIS AUTOMATIC SUBSTATION SWITCHBOARD ON STREET-LIGHTING SYSTEM

The astronomical clock which regulates the turning on and off of the lights according to the season of the year is seen in the lower left-hand corner

An area of 3½ square miles bounded by Arsenal Street, Compton Avenue, Chouteau Avenue, and the Mississippi River is included in the Anne Avenue territory, serving 3,923 lights mounted on Hollow-spun granite standards.

The automatic features of the station are interesting. When the time arrives for turning on the lights in the evening, the station clock closes a contact which sets in motion a sequence of automatic operations. The clock is motor-wound and is equipped with an astronomical dial which changes with the seasons. An auxiliary circuit which governs all the automatic apparatus is set in operation with the closing of the time contact. The first operation is testing the seven branch circuits which radiate from the station to the surrounding districts. If these branches are open, as they should be, an "open-circuit" relay closes and locks itself. In turn, a "master sequence" relay is started up. This relay contains a motor-driven contact drum, two revolutions of which will account for all the rest of the automatic working of the station.

The first of the master sequence contacts connects one of the incoming 13,000-volt lines to the station bus-bar or main panel. If there is no current in this feeder, the bus-bar contact will be connected to the other incoming line. If there is no current here, either, the relays controlled by the first contact will trip the master sequence relay immediately and prevent its further operation until current is supplied on the feeder lines.

After the station bus-bar is connected to a live incoming line, the master relay drum continues to rotate slowly. After five seconds the first contact is closed. The control relay is actuated which causes the first of the seven branch switches to be electrically closed. The other six branches are connected to the station bus at intervals of five seconds by similar operation.

After the last circuit has been cut in, the auxiliary control circuit which operates the master relay is opened automatically, stopping the drum at the end of two revolutions in position ready for its next use. Normally, it would be used again near daybreak when the astronomical dial silently says "lights out." But if trouble were to develop at any place in the system during the night, the master relay would be again called into play, this time to reverse its previous operation by "kicking out" the branch circuits and disconnecting the incoming lines from the station bus-bar.

Each of the branch circuits at the station goes through two constant current regulators. The regulators function also as transformers, stepping down the voltage from 13,000 to 1,500 volts and supplying a steady current of 20 amperes to the branch circuit.

Aside from the cleaning and oiling of movable parts and general work about the station, no attendance is required. If something were to happen to a pair of the regulators, an inspector would go to the substation and throw one switch which would automatically cut in a spare unit to take the place of the disabled one. The automatic features of the new system are important both as labor-savers and as a protection against human fallibility. For the purpose of inspection and testing the apparatus has been designed so that it may also be operated manually.

An Idea Whose Time Has Come

By Mrs. John T. Fuller

Member Inter-Racial Committee, Orlando Chamber of Commerce

"MIGHTIER than an army with banners is an idea whose time has come."

Some great leader has thus voiced the basic truth which underlies all progress, and the Orlando Chamber of Commerce, recognizing this truth, has also recognized the equally important fact that an army, though marching with banners, must be organized and coordinated under wise and competent leadership if victory or success is to be obtained. Therefore, deeply conscious of the necessity of recognition of the rights and needs of all the people of the community, an Inter-Racial Committee was appointed and has been functioning since June, 1926.

Orlando is especially favored in the superior quality of the majority of its negro population, the leadership along both business and social lines being of an unusually high type. There has been persistent effort during recent years to maintain high moral and ethical standards, and this has resulted in great material progress and in creating a very real respect for the negroes among the white citizenship.

A Florida Chamber of Commerce Helps Solve the Negro Problem

In the opinion of Karl Lehmann, General Secretary, the Orlando Chamber of Commerce has never done a more valuable or far-reaching thing in its history than the appointment of an Inter-Racial Committee composed of five of the most prominent people in the city, who have through frequent conferences with the leaders of the negro race established a sympathetic relationship between the races in this growing city.

This committee consists of C. A. Russ, a prominent manufacturer, Chairman; Mrs. John T. Fuller, who has been for a number of years one of the most active leaders in social and club work in the state of Florida; L. M. Autrey, capitalist, bank director, and Mayor of Orlando; A. Phil Maurer, prominent realtor, director of the Orlando Realty Board, Bank of Orange and Trust Company, Orlando Chamber of Commerce, and immediate past President of the Lions Club of Orlando; and S. Kendrick Guernsey, who is Vice-President of Rotary International, Vice-President of the Church Street Bank, and Vice-President of the Victory National Life Insurance Company of Tampa.

Mr. Lehmann believes that every community in America that has in it a large portion of negro population needs such an Inter-Racial Committee, and that if they will choose a wise and competent committee, the results will be of tremendous value to both races and to the community as a whole.

Activities of the Inter-Racial Committee

The great need of a colored day nursery for the care of little children while the mothers were at work was presented by the Inter-Racial Committee to the City Commission. After investigating and finding that public-spirited and kind-hearted negro women with the help of white friends were struggling with a very real problem, the Commission voted a monthly contribution to help carry on this work. This kind of official interest and cooperation has meant much in creating a whole-hearted loyalty to the city and has fostered a deeper sense of civic responsibility among the colored people.

The negro committee presents a written report at each monthly meeting of the Inter-Racial Committee. We give here extracts from some of these reports, as evidencing the sense of the certainty of a fair hearing and sympathetic understanding of conditions; and also the results of some of the discussions and subsequent recommendations:

JULY

"The negro branch of this committee wishes to express its gratitude to you and the city officiary for the marked improvements that have been made along social and economic lines in our city in recent months. This pertains largely to treatment and consideration of our people by the city officials."

AUGUST

"We wish to state that the mass meeting held at the Shiloh Baptist Church, Sunday, July 11, was a flattering success and we believe that we voice the sentiments of the entire colored citizenry in saying that we were all greatly benefited by the splendid addresses delivered by the members of the white committee and by the sense of cooperation and help that characterized that whole meeting. It was the first meeting of its kind ever held here under similar circumstances, and as a result greater interest and enthusiasm were aroused among our people along social and economic lines than we have ever known. From the least to the greatest among us, we have felt the effect of the improved management in recent months. Thanking you for the prompt and immediate attention given to all matters previously submitted to you and for sympathetic interest in all our affairs, we remain."

NEGRO INTER-RACIAL COMMITTEE OF ORLANDO, FLA., APPOINTED BY THE NEGRO BUSINESS MEN'S LEAGUE

Left to right, seated: S. G. Baker, insurance, District Manager, North Carolina Mutual Insurance Company, and Secretary, Negro Business Men's League; J. A. Colyer, real estate; Dr. W. M. Wells, physician; standing, H. K. Hill, pastor, Mount Zion Baptist Church; A. C. Kroons, printer; Dr. J. V. Williams, druggist, President, Negro Business Men's League; Professor L. C. Jones, principal Jones High School

SEPTEMBER

"There never was a time in the history of Orlando that our group of people has more sensibly felt the importance of having direct contact with the officiary of our city, and there has never been a time when we felt as friendly in bringing our matters before our officers as at the present. We attribute in the main these improved conditions and relationships to the work of the Inter-Racial Committee, of the Orlando Chamber of Commerce.

OCTOBER

"Better treatment is accorded our people than ever before in the history of Orlando, and all are appreciative and rejoice at the dawn of this happy, progressive era for which we have long prayed and looked. Among recent activities the outstanding one has been relief work for the storm sufferers in the south of the state. We as negroes have collected $700.43 in cash and large quantities of food and clothing, and have provided and cared for thirty-six refugees who came here from Moorehaven, supplying all their needs until they could be permanently located. We are feeling very grateful to a divine Heavenly Father for the pleasant and comfortable conditions that obtain in our great city, and are appreciative of our friends who have mingled with us, shared our burdens, and discussed and made plans for the betterment of our people in general."

From the Chairman of the Negro Committee

"Perhaps no one thing has happened in the history of the city of Orlando that, if it continues, will have more influence on its growth and happiness, than the organization and functioning of the Inter-Racial Committee.

"In my opinion, a world of misunderstanding and suspicion has obtained between the races (fated to live together) by poor contact.

"Heretofore we have not intelligently striven to get each other's point of view on any question; but God in his wisdom and mercy moved upon the hearts of a few of his servants to stop a moment and consider this question. As this city is inhabited by members of many races of people, would it not be right and just to give all an opportunity to express their needs? Hence our committee. I thank God for this opportunity to express my heart-felt gratitude for the splendid results that are already showing from its work. .. .. ..

"The people of our group feel a greater security in every way than ever before and are sincerely appreciative of results obtained in the short time the committee has been at work.

"Long may we continue the good work so well started."

J .A. COLYER,
Chairman Negro Committee.

Home Demonstrations and Library Activities

The work of the colored public health nurse and the colored home demonstration agent have been conspicuous factors in the establishing and

JONES MEMORIAL HIGH SCHOOL FOR NEGROES, ORLANDO

The finest high school building for negroes in Florida; built and operated under the Department of Public Instruction of Orange County, Florida, and named for Professor L. C. Jones, the efficient negro principal of this school for several years

maintaining of higher standards of life and living among the colored people of Orlando and Orange County. The salary of the home demonstration agent is paid jointly from the Federal, state and county agricultural funds. She therefore covers a wide field, and has a broad scope of influence, as is also true of the public health nurse.

In June, 1924, the Albertson Public Library established the Booker T. Washington Branch on South Terry Street for the colored population of Orlando. The name for the branch was selected by the negroes. The Booker T. Washington Branch houses over 1,500 volumes, and is made up of a reference, lending, reading, and children's collection.

Mrs. Cromartie (colored), assistant in charge of the Booker T. Washington Branch, reports the following:

"Total enrollment to date 916. Circulation for the month of November, 1926, totaled 1,428. The circulation usually totals 1,000 per month, therefore it is gratifying to note the increase in circulation."

Every Friday afternoon the children's librarian from Albertson Public Library goes to the branch to tell stories to the children. The story hours are well attended. Colored children are usually very adept at telling stories in the negro dialect.

Other Cities Please Copy

The Chamber of Commerce is convinced that every community that has two or more different races making up its citizenship will find it worth while to work out a sane and sympathetic solution of problems that necessarily arise. Orlando has found the beginning of this solution in its Inter-Racial Commission, but is convinced that the most important factor in the case is the personnel of the committee appointed by the Chamber of Commerce. There must be common sense and sympathy and the progressive vision of what interrelationships mean and also of the rights and privileges and interests of every individual citizen. With a committee of this type from the local chamber of commerce and a committee representing the best leadership among the colored population, we believe that racial problems anywhere are capable of solution.

"My Town Can't Be Too Good for Me"

By "Wib" Chaffee

My Town can't be too good for me,
Nor I too big or good for it;
Though small in size My Town may be,
I'd have it big in "Push" and "Grit."
My Town must meet emergencies
With dauntless courage, vim and "Pep;"
Though progress is not bought with ease,
My Town must not get "out of step."
My Town must tackle every task—
Go forward always—ne'er back down.

'Neath foreign suns though I may bask,
I'd think with pride of this, My Town.
My Town, of course, is good enough,
No matter how my fortune swell,
Nor yet how fortune may rebuff.
My Town's defamers I would quell.
—And yet deep down within my heart
I know My Town improved could be;
To help improve I'll do my part—
My Town can't be too good for me!

United States Supreme Court's Decision in Indianapolis Water Case

What Will Be Its Effect on the Future of Public Utility Rates and Municipal Ownership in American Cities?

By H. M. Olmsted

THE Supreme Court of the United States rendered a decision of far-reaching importance in public utility rate cases late in 1926, in the case of John W. McCardle, et al., as Members of the Public Service Commission of Indiana, et al., v. Indianapolis Water Company.

A Brief History of the Case

The water company had, in 1923, proposed an increase in rates, which the city opposed. The Commission, fixing the valuation at the sum of $15,260,400, and allowing 7 per cent return, declared the existing rates inadequate and prescribed some increases, although disapproving the schedule sought by the company. The latter was not satisfied, and obtained an injunction against the new rates as confiscatory, claiming that its property was worth not less than $19,000,000.

The Commission's valuation was based primarily on average prices for the ten-year period ending with 1921, with about 6 per cent deducted for depreciation, and the addition of about 6 per cent for water rights and going value and about 1 per cent for cash working capital.

Justice Butler's opinion speaks in favor of present-day reproduction cost at "spot" prices —in this case, as of January 1, 1924—with some recognition of depreciation (not disputing the Commission's small deduction), and the addition of over 10 per cent for water rights and going value. This procedure, however, using the Commission engineer's figures for the basis mentioned, would give a total exceeding $21,585,000. The actual amount found in the opinion as the minimum value—$19,000,000, which was the finding in the lower court, and was in turn the minimum named by the company in its application—is thus somewhat less than the minimum which the opinion would otherwise support, being about 88 per cent thereof.

An Important Decision by a Divided Court

The decision of the United States Supreme Court in the Indianapolis Water case, discussed in the accompanying article, was handed down November 22, 1926. The opinion was written by Justice Butler. It affirms the decree of the District Court for Indiana, which enjoined the Public Service Commission from enforcing the schedule of rates that it sought to establish, and which raised the valuation of the Company from $15,260,400, the Commission's figure, to $19,000,000. The opinion contains various expressions on the part of Justice Butler indicating that he leans toward a treatment of the Company's claims that would exceed in generosity that of the lower court; and these will no doubt be made much of by public utility companies in present and future rate cases.

Justice Holmes concurred in the result only. Justices Brandeis and Stone could concur in neither the result nor the opinion and the former wrote a dissenting opinion in which the latter joined.

Outstanding Securities of Operating and Holding Corporations

A glance at its capitalization helps to explain why the Company is apparently content with a result somewhat below what the expressed views of Justice Butler and of District Judge Geiger would sustain. On January 1, 1924, the date to which the $19,000,000 applies, the Company had outstanding $5,000,000 of common stock, $4,500,000 of 5½ per cent bonds and $3,731,000 of 4½ per cent bonds, a total of $13,231,000. The interest charges amounted to $415,395 per annum. Seven per cent on $21,585,000, the minimum sustained by Justice Butler's dicta, would be $1,510,950, which would allow nearly 22 per cent dividends on the stock. Seven per cent on $19,000,000, the specific value stated in the decision, is $1,330,000, which would allow over 18 per cent on the stock. The actual dividend paid in 1924, under the Commission's schedule of rates, which was declared confiscatory, was 10 per cent.

Practically all of the common stock of the Indianapolis Water Company is owned by the Indianapolis Water Works Securities Com-

pany, which on January 1, 1924, had outstanding $2,000,000 of common stock, $1,500,000 of 7 per cent preferred stock, and $2,500,000 of 6 per cent bonds—a total of $6,000,000, or a million in excess of the par value of the water company's stock, the dividends from which constitute the sole income of the holding company. A 10 per cent dividend by the water company would give over 12 per cent on the common stock of the holding company after the bonds and preferred stock of the latter were taken care of. An 18 per cent dividend by the water company would make possible a 32 per cent dividend by the holding company; and 22 per cent by the former would allow 42 per cent by the latter.

Possible Effects on Public Ownership

In some quarters the decision has been interpreted as an aid to public ownership. It strengthens some of the arguments of public ownership advocates, as to the present high values allowed to private companies, as compared to the actual investment basis used by publicly owned utilities; as to the uncertainty of the value when dependent on shifting prices —an uncertainty which affects both the consumer and the investor; and as to the rate of return. From an investigation of the Company's books the Commission in a later proceeding (P.U.R.1925C,439) found the actual cost of the Company's property to have been $8,612,399 at the time as of which the $19,000,000 valuation was set by the Federal Court. Considering the lower rate of return on municipal water bonds, the total amount of return on capital as a private enterprise would be about three times what would have been required if the water system had been a municipal project from the beginning. Return on capital under the court decision takes a little over half of the necessary gross revenue; and the corresponding rates would be about 50 per cent higher than if, through public ownership, the return on capital had been one-third as great. This assumes approximately equal ability in the conduct of the enterprise municipally or privately; and as public ownership and operation of water systems are the widely accepted mode, this does not seem a violent assumption.

The excess valuation awarded the private company, as compared with the actual inyestment which would be the basis for rates in the case of a municipal enterprise of the same physical history, is not wholly due to the higher price-level of the present, as compared with the actual period of the major construction. The opinion of Justice Butler states, "The evidence sustains an amount in excess of 10 per cent to cover water rights and going value," this constituting a permanent addition above actual investment. The device of going value, together with the usual allowance of theoretical structural overheads on reproduction cost exceeding the actual capital expenditures of this nature, provides a means of keeping a reproduction-cost valuation above actual investment even though prices fall; and as no definite, logical basis of calculation is provided for going value, there remains the possibility that it can be gradually stretched to protect the actual investment despite a considerable decline of prices, before it may be found necessary to revise the general valuation theory.

Minor Fluctuations and Established Values

As to the public ownership argument that private ownership means uncertainty of value, it is furthered in this decision by the words, "It is well established that values of utility properties fluctuate, and that owners must bear the decline and are entitled to the increase." It may be noted here that the Commission, in the later case referred to above, cited uncontradicted evidence that between January 1, 1924, and November 1, 1924, the spot price of the cast iron pipe in the company's system had declined $674,675.55. Under the Butler opinion, however, although it approves spot reproduction cost as dominant evidence of value, this rapid and striking decline might not be recognized, for care is taken to state that "frequent minor fluctuations in the prices of material and labor" are not to be allowed to disturb established values, but only changes in "the relatively permanent levels and trends of such prices." The room for conjecture is evident.

As to rate of return, the decision says, "The evidence is more than sufficient to sustain the rate of 7 per cent found by the Commission. And recent decisions support a higher rate of return." Thus the discrepancy between the rate of return allowed to private utility owners and that required by public enterprises is made more pronounced and secure. Justice Butler had foreshadowed his present statement in 1923, when, in writing the opinion in the Bluefield Water Works case (262 U. S., 679), he had held that a return of 6 per cent was confiscatory.

These arguments may be effective in the case of new utility projects where a choice between private or public development is to be made; but the decision is not likely to assist in any transfer of ownership from private to public in the case of existing utilities, the capitalization of which is around fifteen billions of dollars, not including steam railroads. The allowance of present-day reproduction cost might not in itself be an obstacle, provided the

accepted estimate of reproduction cost new should closely represent the present cost of construction of a modern, highly efficient system. But the decision provides against this by the words, "There is to be ascertained the value of the plant used to give the service and not the estimated cost of a different plant." As Justice Brandeis pointed out in his separate opinion in the Southwestern Bell Telephone case (262 U. S., 276), "Surely the cost of an equally efficient substitute must be the maximum of the rate base, if prudent investment be rejected as the measure."

Effect of Depreciation Policy

If a municipality were not deterred from purchasing an existing utility by having to pay a price based on present costs of plant now out of date to a greater or less extent, instead of on the cost of a completely modern plant, and also by the inclusion of going value, the question whether to buy would probably be settled in the negative by the effect of the depreciation policy upheld by Justice Butler. The city had contended for a depreciation deduction based on the straight-line method, taking full account of the ages and prospective lives of the various elements of property, the amount so found being some 25 per cent. The Commission engineers, presumably using the sinking-fund method, in addition to inspection of the property, had set up about 6 per cent. One Company witness, by means of an inspection and some consideration of prospective lives, had found somewhat less than 6 per cent; another had denied any depreciation, on the familiar plea that the property was in 100 per cent *operating* condition, but had made an estimate, amounting to about 2 per cent of cost new, of what would be required to rehabilitate the property. Justice Butler rejects the city's method; evidently considers the Commission's method permissible; and says nothing against nor specifically for either of the Company methods, but states a preference for estimates based on examination (inspection) rather than on "assumed probabilities" (estimates of prospective life—made, naturally, in the light of an examination).

The Commission has approved an annual depreciation allowance of 1 per cent of the cost of the depreciable property. The plant has been a substantial one for several decades, and, being a water system, includes much long-lived property, so that its composite age would very likely be considerable; yet an accrued depreciation of some 6 per cent is all that is recognized. If a city is asked to pay for an old plant a price but little if any under that of a new one, disregarding the factors of price levels and intangibles, the plain common sense of the situation would prevent the deal except as a desperate measure, alleviated to some extent by the saving in the rate of return on capital. As an alternative, duplication and competition might become attractive.

A Notable Example of Municipal Cooperation

IN the February issue of THE AMERCAN CITY was published an article entitled "A Notable Example of Municipal Cooperation."

The article in question recited how, without legal or legislative compulsion of any sort, eleven municipalities in New Jersey, comprising the cities of Newark, East Orange and Summit, the towns of West Orange and Irvington, the townships of Millburn, Maplewood, Hillside and Union, the village of South Orange and the borough of Roselle Park, voluntarily joined forces to construct a Joint Outlet Sewer to tidewater, including the construction of a sewage disposal plant.

The success in getting so many municipalities to join in a common enterprise is notable especially at this time, because there is a tendency to take the authority for constructing such projects out of the hands of the municipalities and place it in the hands of state or county commissions. In fact, in the state of New Jersey there is now much discussion in regard to the creation of a commission for handling water-supply and main drainage districts. Clemens Herschel, consulting engineer, points out the advantages of this in his paper before the American Water Works Association, Vol. 16, No. 5, November, 1926. The creation of such commissions will undoubtedly take away power from the municipalities, and the municipalities are naturally jealous to retain their right of individual action.

The method adopted in the case of the Joint Trunk Sewer certainly represents a more democratic way of undertaking public works. The success of this method, however, usually depends upon the heroic efforts of one or more individuals. In this particular case the brunt of the work fell upon the shoulders of the engineer—and logically so, for this work is the outgrowth of another joint project built for six municipalities in 1902, which are now interested in the present project and on which Alexander Potter, consulting engineer, New York City, has been continuously retained.

The original sewer, which is now grossly inadequate because of the enormous growth of the municipalities, was constructed upon the same scheme of voluntary cooperation planned for the new construction, which method was suggested by Alexander Potter as the original basis of cooperation.

Health and Taxes

By G. S. Luckett, M. D.

State Director of Public Health, Santa Fe, N. Mex.

A HEALTH department is often referred to as a frill, a nuisance, and a useless waste of public money. Why, then, do we continue to pay taxes for public health purposes? Only because it has become "the thing to do," and no one quite has the nerve to be unconventional? Or are there some really good reasons for pouring out a few millions every year on this stepchild of government? Many such reasons have been alleged, but it will be worth while to stand them up again for inspection.

A very real one, never mentioned in the best circles but powerful enough in some quarters, may be ignored, namely, rewarding the faithful. Wherever that prevails, the last word has been said.

But, where there is a sincere desire to do more than provide jobs, I find the answer to our question boils down to a single principle: public health activities are intended to insure protection and to promote fuller enjoyment of efficient life for all the people. "Enjoyment" in this sense is broader than mere superficial pleasure; it connotes vigor, ambition, abundant health, success, energy—all that goes into the living of life effectively and satisfactorily. But this is too sweeping a generality. Just how does a health department come to arrogate so much to itself?

If it happens to be a local county or city department, it affords protection of health for the people of the community in a number of ways: by direct control of contagious disease; by regulation of the sanitary qualities of foods and of water; by safe disposal of wastes; by elimination of insect carriers; and by permanent registration of the two most important events in life—birth and death. Not one of these things can be done by the individual for himself; they depend upon legal powers vested in the health officer and giving him the authority to control those who do not regard the rights of others. The extent to which he can give impartial protection depends upon the willingness of officials and citizens to uphold his hands, even when the "best people" must be compelled to obey the law.

A pleasanter side of local health work is that of promoting better health. Maternal, infant and school hygiene, mental hygiene, educational functions, correction of defects, preventive clinics, and periodic physical examinations of the apparently healthy, contribute to this. They are not compulsory police duties, but are activities of the health officer in his capacity as expert public adviser upon preventive medicine and hygiene.

A trifle more remote, but just as real, are the protection and enjoyment vouchsafed by the state health department. Most of its work is more general in character than that of the local agency. It usually has certain quasi-legislative and quasi-judicial duties, such as issuing regulations and passing upon appeals and complaints. The state maintains some degree of supervision over local health work and attempts to hold it to a high level of efficiency everywhere. Whenever local machinery breaks down, emergency aid is given by the state. If help or advice is needed on some unusual question, it stands ready to answer the call. Some kinds of service are beyond the financial capabilities of small departments, but can be supplied economically by the state. Sanitary engineering advice, expert, specialized medical consultation, laboratory facilities, and educational material and personnel, are a few of the obvious things which a state can and ought to provide for its small communities. The state department acts also as a clearing-house for state-wide statistical information. Liaison

Death and Taxes

The old saying which emphasizes the certainty of death and taxes continues to be altogether too true; but it has also been proved to be true that an intelligent increase in the second of these penalties of human existence will postpone for many taxpayers the imposition of the first. As Dr. Luckett points out in the accompanying article:

"We have almost reached the point where it can be said that so much money spent will bring so much return in better health. But there must be some qualifications as to this statement. The personnel of health departments must be trained for the highly specialized work in hand; they must be efficient workers, and they must be assured of continuous tenure of office and freedom from political interference, if they are to be expected to give service commensurate with present scientific knowledge."

with other states and with national bodies can be maintained more easily through a central state office, and some national agencies will not deal with any other. Intercommunity control of sources and vectors of disease is a state function.

Some of these activities come under the head of protection, while others promote enjoyment, as previously defined. Still others partake of both natures. Most states recognize the general principle that the largest measure of autonomy should be granted each local unit, consistent with adequate protection for all the people. Extension of service in the realm of health promotion, beyond the strict bounds of protection, will depend upon the wishes of the public.

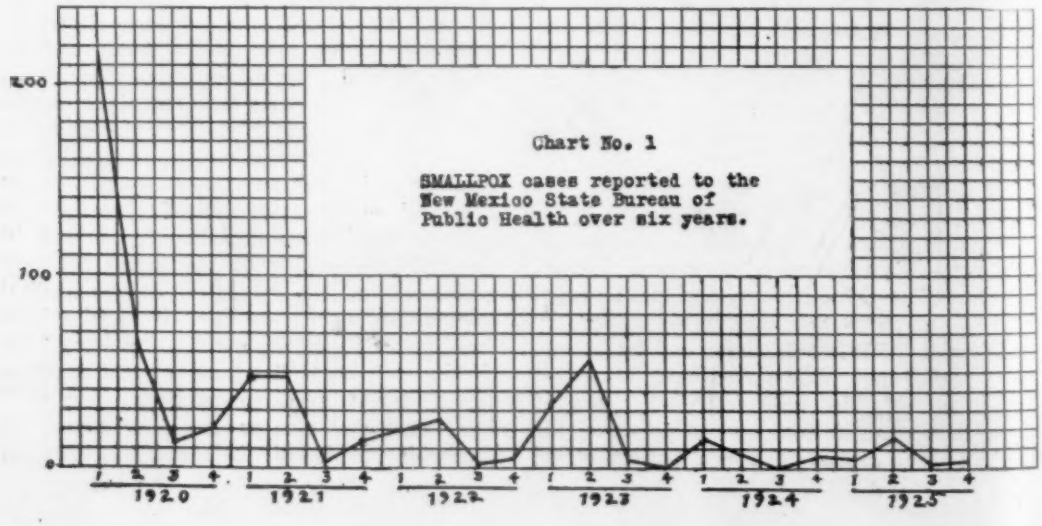
Whether we realize it or not, we all pay taxes to support national health service. Some of the reasons offered for its existence and expansion are the need of quarantine service at ports of entry to the country, interstate quarantine, supervision over wards of the government, investigation and research in matters of national concern, dissemination of information and advice that are of interest to all states, and the collection and publication of national statistics, upon which most of our more fundamental procedures are based. Here, again, we have both protection and the promotion of enjoyment closely joined. It is in the latter field that much controversy arises, especially when the Federal Government proposes to subsidize state activities, as in the case of the Sheppard-Towner Act "for the promotion of the welfare and hygiene of maternity and infancy."

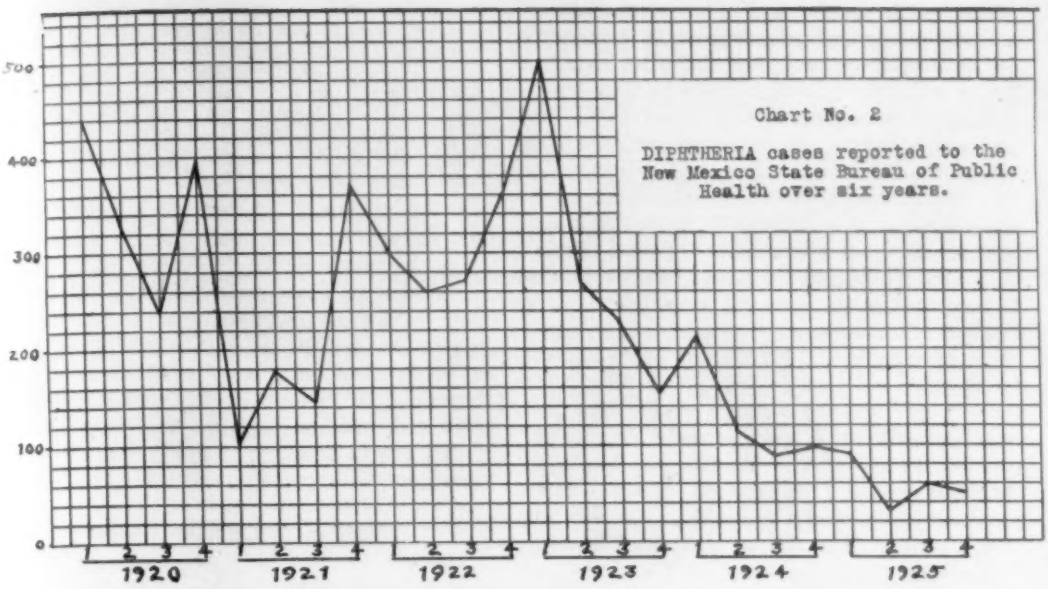
Here I have arranged as briefly as possible the reasons given for supporting health activities by taxation. How they appeal to various elements of our citizenry will depend very much upon each individual's enlightenment, upon his general philosophy of physical causes, and upon his emotional reactions unconditioned by any reasoning at all. But I believe that a fairly large proportion of the taxpayers accept most of these reasons as sufficiently valid to warrant support of such activities out of public funds. Conceiving "the state" abstractly, it is certainly dependent upon the vitality of its people. When one-third of its young men are physically or mentally unfit for military duty, there is good reason to ask whether the state is not unduly handicapped in peace. This fact has already given an unprecedented impetus to popular encouragement of public health work, especially in the promotion of greater physical and mental fitness.

Does the Taxpayer Get What He Pays For?

A very natural question, asked by many sincere inquirers, is: Do we get what we pay for? Does public health work actually "deliver the goods"? That is a fair enough question and one that every health officer should ponder constantly. It is the right of every taxpayer to know whether the claims of his health department are substantiated by demonstrable facts, or are only the outcome of "wishful thinking." It ought to be admitted that some public health enterprises have been founded on plausible theories alone, and their so-called "results" have been the products of unsound logic. But these are negligible when set alongside the really stupendous achievements of soundly conceived and properly executed work.

A time-worn example is the building of the Panama Canal. After France had failed to the tune of untold millions, because of the ghastly cost in human lives, Gorgas made the thing possible by a thoroughgoing application of prin-





ciples known to every health officer. Yellow fever cost the Southern Pacific Railroad one million dollars in 1897 and cost New Orleans over ten millions. Some medical men in our Army discovered how the disease spread, and it is now only a tradition in this country. In fact, it has been driven to its last retreat through the efficient application of specific sanitary measures. Cholera was a common cause of death in the United States, two generations ago. Whoever hears of it in this country today? The use of common sanitary measures and the vigilance of our medical officers at the ports have brought about the change. So we could go on piling up examples on a national scale, but a few specific local cases may be even more convincing.

Definite Results Accomplished

New York City has more than cut its infant deaths in two, during twenty years, by means of a steady sanitary campaign combined with education. Chicago held an unenviable record for the incidence of typhoid fever, until it applied sanitary principles that have reduced the figures materially. In our own state of New Mexico smallpox was an every-day occurrence up to 1920, when enforcement of compulsory vaccination for school children began in earnest. Chart No. 1 shows the results.

In 1925, there was a drop in the number of cases reported amounting to 78 per cent below the average of five preceding years, while the United States as a whole had a decline of only 1.8 per cent for similar periods. Diphtheria (Chart No. 2) is following the same trend, although protective measures against it are only voluntary. Again, diphtheria figures for 1925 are 77 per cent below the previous five-year average, with a corresponding reduction of only 32 per cent for the entire country.

Extensive outbreaks of typhoid fever came to the city of Albuquerque repeatedly, until the present efficient health department gained control of milk production. These milk-borne epidemics occur no longer. A county school superintendent reported to me that, in the memory of several old residents, not a year had passed in his county without the closing of a few schools because of contagious diseases. Since the creation of the full-time county health department, five years ago, not a school has been closed for this cause. When we realize that it costs $93 a year to put one pupil through school in that county, the value to the taxpayer is obvious. And so I could continue with proof of the practical value of public health work, proof that the taxpayer gets his money's worth in direct protection against disease, in promotion of his comfort and his enjoyment of life. The figures are available to anyone in state and Federal reports and in a number of books and pamphlets prepared for both professional and lay readers.

What Ought Public Health Work to Cost?

A final and pertinent question is, How much ought public health work to cost the taxpayer? Obviously, present costs are not always a safe guide. If a health department is merely a "pie counter," its expenditures cannot be a correct measure of service rendered. But if the department is operating with some degree of efficiency, its expenditures may be so used, with due caution. Other data may be derived from estimates based upon the giving of com-

plete health service and the known costs of various public and private agencies engaged in its several branches. On the other hand, a really efficient department may be so handicapped by inadequate appropriations that it cannot show results commensurate with its ability, so that its actual costs are not a criterion of what it should have. Bearing these conditions in mind, it is interesting to see that a survey of 86 small cities in the United States[1] discovers the per capita cost of health service to average 42 cents, with a minimum of 6 cents and a maximum of 91 cents. The upper third of these cities average 63 cents and the lower third 21 cents. Not all of them were doing work of even average quality, but just over half attained a score of more than 50 per cent on the basis of a schedule that had been carefully prepared beforehand. In the same report is reproduced a comprehensive plan for health service in a city of 50,000. The estimated cost, derived from a study of departments in actual operation, ranges from $1.59 to $1.78 per capita.

For some years, the International Health Board of the Rockefeller Foundation has been preparing a standard budget for rural health departments, and concludes that 50 cents per capita is reasonable in a county of 20,000 population. Our own full-time county health units in New Mexico spend about 42 cents per capita of public funds. With the addition of outside aid, it totals 47 cents from public and private sources.

State expenditures for health purposes are as varied as the number of states themselves, but rarely run to 10 cents per capita.

Federal appropriations for health protection and promotion seem absurdly pitiful when compared with the grand total. Of each dollar of taxpayers' money spent by the Federal Government, only *four-tenths of one cent* was devoted to health in the 1923-24 budget.[2]

Another means of estimating the cost of complete health service is to examine expenditures of industrial organizations for this purpose. Obviously, they are not throwing away money uselessly. Including medical care, the cost per employee has been found to vary from $2.21 to $11.23.[3] The Metropolitan Life Insurance Company has spent several millions in preventive health work. It sums up results as follows:

"This business organization in the last fifteen years has expended a total of $18,709,000 in the conduct of its public health campaign for industrial policyholders. It has increased its annual budget for welfare work in response to an increasing demand for service and also to the increasingly favorable results of the work done. For in the interval the mortality rate has declined more than 30 per cent, and the accumulated saving in mortality between 1911 and 1923 which can be ascribed only to the work of the company has totaled the amazing sum of $35,000,000, nearly twice the total expended."[3]

We have almost reached the point where it can be said that so much money spent will bring so much return in better health. But there must be some qualifications to this statement. The personnel of health departments must be trained for the highly specialized work in hand; they must be efficient workers, and they must be assured of continuous tenure of office and freedom from political interference, if they are to be expected to give service commensurate with present scientific knowledge.

Planning the Health Budget

There must also be a permanent policy of appropriating reasonably ample funds, so that a continuing program may be planned to cover a long period. Hit-or-miss plans, with high peaks and low valleys of effort, are wasteful. The blind slashing of budgets by appropriating bodies and tax commissions is not in the least constructive. Too often there is an effort to reduce, to squeeze out a further saving from health funds, without any consideration whatever of the effects. I have sometimes had the experience with a State Tax Commission of being asked about the quality of service given by a health officer, as a factor in determining the amount to be allowed in his budget. When I have replied honestly that he was not giving service and have recommended a cut, it has usually been adopted with joy, unless he happened to have some influence in his community. On the other hand, when I have recommended an increase for a conscientious, hard-working health officer, I have invariably failed to make the least impression. This is not constructive taxation, but is merely a blind slashing regardless of ultimate results. The taxpayers' associations could profitably study the comparative value to counties and cities of the varieties of local health service found in this or any other state and recommend a constructive program. Most state health departments are eager to see an improvement in the quality of local service, not merely an increase of expenditures, and will cooperate in such a study.

The people themselves will easily grasp the connection between a sound public health program and the necessary cost of conducting it. They are already alive to the value of preventive medicine and will welcome informed leadership to make it effective for the whole population.

[1] Health Survey of 86 Cities, American Child Health Association, New York, 1925.
[2] Public Health in the United States by Moore, H. H., Harper and Brothers, New York, 1923.
[3] Health Work Pays, by Dublin, L. I., Metropolitan Life Insurance Company, New York, 1925.

The City and the Citizen

Live Letters from an Expert on Municipal Problems to the People of Hometown—Written for The Hometown Morning Star

By Louis Brownlow

Under a heading such as the above, leading newspapers in a growing list of cities have begun the publication of a series of daily articles on municipal and civic problems. The author of the series, as former Commissioner of the District of Columbia and subsequently City Manager of Petersburg and Knoxville, is well qualified by technical knowledge and practical experience for the task—and as the two specimens which follow demonstrate, by ability also as a newspaper writer. Municipal officials and civic organizations desirous of enlisting the cooperation of their local newspapers in this movement for a more enlightened citizenship, can obtain full information as to the project by addressing Mr. Brownlow as editor of Current News Features, Inc., Star Building, Washington, D. C.

The City and Public Works

IN the earliest dawn of our civilization, when some of our ancestors decided to quit roaming around and settle down, they built some huts and said to each other: "Behold, here is the first city!"

But they found that their throats were too dry and their feet too damp.

So they organized a Department of Public Works.

The Department promptly put in a water system and paved the streets.

About a week later the Commissioner of Public Works was called to the 'phone. "That the City Hall?" "Yes, Commissioner of Public Works, complaint clerk, on the line."

"Complaint clerk? Say, thass good. Say, lissen. This is O'Magnon speakin'. C. R. O'Magnon of 5117 Grand Avenue. Say, Lissen. I just moved in here from outa town, and say, lissen, the water this mornin' s'muddy I can't see the bottom o' th' tub, and say, lissen, they's a hole out here at Grand Avenue and Fifty-second Street that you can lose a Fifth Avenue bus in."

What boots it that Mr. O'Magnon has hitherto pulled himself through quagmires in the forest, or drank out of water holes in the desert, or not known how to mark his weekends by his bathing habits? He has come to town, now, and he is C. R. O'Magnon of 5117 Grand Avenue, to be treated accordingly.

So during some thousands of years there has been friction and hard feeling and lack of understanding between the Department of Public Works and the People of the city. It started out that way. The engineers at the department of public works are dealing with engineering problems that have as their ultimate aim the convenience of the people of the city, but right now, this very morning, this very hour, the immediate engineering problem bulks larger in the eyes of the department than does the convenience of the people. On the other hand, the people are not interested in working out engineering problems, but in keeping their throats wet with good water, their feet dry with good pavements, their ways level with strong bridges, and the town drained with ample sewers.

As in the days of our earliest town-dwelling ancestors, the average citizen thinks about the public works of his town only when the water in the pipes gets muddy or there is a hole in the pavement.

All of the people in the city never think about the city's public works at one time until some disaster interrupts the service.

To San Franciscans in 1906 and to Miamians in 1926 for two or three days, the worst of the earthquake and fire, the worst of the wind and flood, was that the city water-supply was stopped. The last thing that the deep-sea fish will ever discover, so the scientists tell us, is water. Without it he will not live an hour, but he has always had it and he does not know what it is that gives him life. The city, too, lives on water. Without it city life is impossible. Yet it is always there, barrng disaster, and rarely comes into the mind of the city unless there is trouble with the supply.

Cities have grown so rapidly that, even where the engineering departments have kept well in advance of the needs, the demands have

grown until a dry season often brings a city to the danger point.

Last year many cities in northern New Jersey and in the southern Appalachian mountains found themselves almost without water. Strict economy was enforced, and in some cities the water was turned on in the mains only for a few hours in the day. Los Angeles, which had spent millions and millions of dollars on hundreds of miles of pipe, found itself literally at war with the farmers who would tap the mains that supplied the distant city. In 1926 New York, the greatest of cities, which long has had good reason for pride in its engineering habit of looking ahead for its water-supply, found it necessary, because rain had been scarce on its watersheds, to warn its millions against the lavish use of water.

The first engineers who laid out the streets of most of our oldest American towns were gentle cows who worked out the best way from the pasture to the barn as they chewed the cud of contemplation. Thus Boston has greater difficulty in taking care of downtown traffic than does Washington, for Boston was laid out along its cowpaths and Washington was laid out by a French army engineer who cut wide diagonal avenues across his gridiron of streets, not for automobiles, to be sure, but to facilitate the action of the artillery in mowing down the rebellious mobs that some day, he thought, might attack the Capitol and the White House.

Rome and other great cities of antiquity added sewer systems to their engineering works of water plants and streets centuries ago, but in American cities sewers were simply private or cooperative drainage systems, leading to the nearest waterway for the first half of our national life. A definitely planned sewer system to serve all the city as a part of its public works was not established until Chicago took the initiative as late as 1855. Now Chicago, as one of the great cities of the world, takes so much water from Lake Michigan for its drainage service that international complications arise on the protest of the people of Canada, who complain that the water-level of their great River St. Lawrence is being lowered by Chicago's diversion.

Cities as they have grown have found themselves pent in by natural barriers, and so New York, for instance, has called upon the bridge builders and the tunnel diggers to help it find room in which to grow; Chattanooga bores holes through the Missionary Ridge that once defended it from an invading army; New Orleans piles high the levee that keeps out the waters of the Mississippi.

When a country crossroads builds a new store and a new filling station and a few more homes, it becomes a country village, and in a little while it finds it needs some organization for its public works. Its first emergence into urban quality is when, having five hundred or a thousand people, it puts in a water system. In that stage of its development its municipal problems probably are 95 per cent engineering problems. As the city grows in size, the relative importance of the purely engineering problems decreases as other municipal activities emerge.

At whatever stage of growth, however, from the least of the villages to New York itself, the everyday life of every person in the town is conditioned by the engineering work of the past and the present.

Water and sewer systems, street pavements, bridges, viaducts and tunnels—these are the public works upon which the existence of the neighborhood depends.

Too often engineers' advice is brushed aside because they seem to ignore the crying need of to-day by delaying a bit of work until it can be planned so as to fit in with what will be the demands of ten or twenty years hence. Too often money is wasted because no one takes a long look ahead.

Too often public works are discussed only in terms of dollars—How much will the job cost? Who will get the contract? How much will it boost the price of my real estate?

Questions that should be asked when public

Neither Laurel Nor Gold Burden the Modern City Engineer

In times past there have been great Commissioners of Public Works such as Necho the Egyptian and Claudius the Roman, great city engineers such as Solomon the Jew and Pericles the Athenian, who found enduring fame in their works.

In modern times, for the most part, the municipal engineer tastes no such fame and his brow never feels the weight of the laurel. Indeed, his pocket is seldom heavy with gold.

But it is he, the engineer, who builds the public works that make the American city of today safe for the citizen to live in, work in, play in.

Go down to his office and get him to tell you of his problems and his visions for the city. Or, still better, invite him before some organization to which you belong and have him tell his story. I will wager that you will have thereafter a better appreciation of his services to you and you will have a better appreciation of the city which you call your own.

works are in contemplation are these: Will it add to the convenience and happiness of living for the people? Will it add to the congestion that is the curse of city life? Will this project fit into what has been provided before, and is it capable of expansion for the needs of the future?

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The City and Public Safety

WHEN the Mayor presents the keys of the city to a distinguished visitor he recalls by that symbolic act the fact that once the most important feature of the city was its wall, its most important function the guarding of that wall.

Security from marauding foes, tribal enemies or mere robbers was sought and largely found in the Wall. In the western world the walled city is an antique memory. Here in America we may see the gates and a bit of the wall that once surrounded St. Augustine, and we know that Wall Street once marked the northern boundary of a timorous Dutch settlement on Manhattan Island. In Europe there are, of course, more ruins of walls, more gates, and even survivals of the walled city with gates that actually are shut of nights.

Public Opinion and Police Efficiency

I believe that it is necessary for the average citizen to learn more about the work of the policeman before public opinion will support the measures that will be necessary to improve police work in American cities.

The ancient city with its wall did not always keep out all the enemies of peace and security. The policemen and the firemen who have taken the place of that wall do not always succeed in their work. But in the olden days no citizen would willingly have given up the wall, and today, even with things as bad as they are, no citizen would go willingly to sleep tonight if the police force and the fire department were not there.

In China the cities still depend upon walls for protection and security, just as the whole nation once sought security in a wall and built the greatest engineering work of all the Orient in the Great Wall. The Chinese even believe in walls to keep out devils, so they say, but even in China the modern cities' significant growth is outside the walls.

The Public Safety was the reason for the wall when the chief threat to that safety was to be found in organized bands of soldiers or of bandits. Today, here in the United States, the Public Safety is still a chief consideration in the problems of the city. But so simple a device as a wall will not assure that maximum of security which the citizens demand.

The enemies of public safety are many and various, but they are of three general types—Crime, Carelessness, Fire. It is to deal with these three enemies that cities establish departments of public safety and within these departments a Police Force and a Fire Department.

The men employed by these two departments wear blue uniforms—usually blue but sometimes khaki—and always are on guard against the enemies of the public safety that no wall can shut out.

The police are fighting crime and carelessness. They are expected to prevent crime if possible, and when crime is done, to detect and arrest the criminal. They are expected to guide us in our traffic ways and make war on that carelessness which is largely responsible for the death-tolls of the automobile in America—24,000 lives a year.

The firemen are fighting fire and carelessness. They are expected to put out fires when they once start and also, in progressive cities at least, to prevent fires by campaigns of education against carelessness and by inspections of buildings so that fire menaces may be corrected.

These are the blue-coated soldiers of the city. They always are on guard, and not a day or a night but that every policeman and every fireman is in danger of his life—always ready to sacrifice his all for the peace and security of the citizens whom he protects.

Under certain exceptional circumstances both policemen and firemen are popular heroes and come in for many expressions of gratitude from the citizens.

Mostly, the policeman is unpopular and the fireman is popular. The reason is not far to seek. The fireman has but one enemy. He waits until the alarm is sounded and than he goes, with great pomp and clanger, to fight fire. Everybody is on the side of the fireman and nobody is on the side of the fire.

The policeman, on the other hand, has a thousand enemies. His every act is a contact with a human being. Except when he is an-

swering a question or giving directions, every contact is in the nature of an interference with what some person is doing or would like to do. So that in everything the policeman does there is at least one person who is not on the side of the policeman. And all the others don't know and rarely care.

(I know all about the faults of policemen and how some of them are dumb and some of them are crooked, and I am going to write about that another day. Today I am writing about the public safety problem as a whole in its broad human aspects.)

We don't think much of the policeman. We frequently say to strangers, "The police force in this town is rotten!" Yet when a burglar has visited our home, we telephone for a policeman and what do we expect?

We expect him to come with the speed of the fire department (even though we do not believe in furnishing automobiles for the police force), and when he has arrived we expect him to have the legal ability of William Howard Taft, and the detective sense of Sherlock Holmes. Sometimes the fellow hasn't got it. That makes us sore.

We pay a policeman anywhere from $90 to $200 a month, according to the size of the city and the section of the country. He ought to be better.

We examine a policeman carefully before we employ him. Nearly everywhere we insist upon his being of a certain height and a certain weight. We listen carefully to his heart, for we are thinking about the pension roll. We even insist that he can read and write. However, very little reading and writing are required in many places if the applicant but have the favor of the political pooh-bah.

Once accepted, we give him a suit of blue clothes, a club, and a pistol as we say to him, "Go out and police!"

I am not going to join those who so lightly put all the blame for the so-called crime wave on the police. I know there are bad policemen. But I also want to look over the courts and the juries and the citizen bodies before I put all the blame on the police. I have found it frequently easier to get a roughneck cop to pinch a criminal than to persuade twelve good church members to convict him.

But I do know that if we are to improve the quality of our public safety work we must do more to train our firemen and policemen.

New York keeps its rookie policemen a whole year in school at full pay before they are put out to do police work. Berkeley, Calif., insists upon even higher types of education and training. Other cities are establishing police schools. But everywhere in America the police force is a purely local institution with its own rules and standards. In most cities nothing of any account is done to improve the training of the city's peace guardians for the ever-increasing complexity of their tasks.

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A Highway Patrol That Helps to Prevent Punctures

BROKEN GLASS MADE HARMLESS

AN organization that saves thousands of punctures during the year, besides rendering other valuable service to motorists in its territory, is the Automobile Club of Southern California. More than 5,000 pounds of broken glass were removed from the pavements in and around Los Angeles during the first month of operation of the new "Broken Glass Patrol" of the Club. This organization operates a fleet of fifteen Dodge Brothers motor cars like the one illustrated, as highway patrols. These cars are constantly traveling back and forth on all the prominent highways of Southern California rendering emergency service to distressed motorists, who find this aid most welcome in times of accident or delay.

The photograph shows the good cheer created by the relief work of the Broken Glass Patrol of the Automobile Club.

Crime Prevention Work by American Police Departments

POINTING out that health departments are carrying on disease prevention work and that fire departments are doing fire prevention work, the New York State Bureau of Municipal Information has attempted to discover what the police departments of American cities are doing along crime prevention lines. To this end the following question was recently addressed by the Bureau to the chief of police of every American city having a population of 30,000 or more and to New York State cities of smaller population:

"Outside of regular patrol work, what does your department do or recommend to prevent crime?"

Replies received from more than 100 cities are quoted in a mimeographed report issued by the Bureau on January 18, 1927. A few of the most constructive of these statements follow:

Police Work a Social Service Problem

COLUMBUS, OHIO.—I do not know what other police departments are doing in the matter of crime prevention work, but so far as my own opinion is concerned, I will say frankly that I believe police work in the last analysis is a social service problem. I also believe that our legislative bodies, as well as our judiciary and the other law-enforcing agencies, and the general public, as well, have considered only the effects of crime, rather than to approach and solve the problem at its source.

As a result of the war-time migration of negroes from the South, we have for some years been confronted in this city with a troublesome race relations problem. These southern migrants coming from the rigid discipline of the Southland, quickly turned their new-found legal equality into license, and it has required unusual tact on the part of our patrolmen to prevent racial clashes. As a social experiment, I detailed a college-trained negro police officer as a social service worker. He has devoted his entire time and attention to the negro problem in our city, and through his efforts we have organized what is known as the Friendly Service Bureau, with branches in each negro residential section; church groups and reputable colored citizens forming the field force. As soon as it is observed that a stranger has appeared in any of the negro residential sections, he is visited by some member of this committee, who ascertains why he has come to our city, and if it is found that he has come to join relatives, or for the purpose of establishing a home, then every effort is made to secure employment for him and to place him in touch with the church group of his religious preference and, by wholesome advice and patient effort, assist him to become oriented to his new and radically changed environment. He is thus prevented from falling into the hands of disreputable members of his own race.

As a result of this experiment, we have already reduced crimes committed by negroes by 40 per cent, and this within less than one year. I believe that this clearly demonstrates that police work is really social service work, and I hope that eventually the American public will awaken to the real situation, and fill their police departments with a personnel who are educationally qualified to approach and perform police duty in its larger aspects.

I am also convinced that much crime is committed by those who are the actual victims of social and economic maladjustment. They lack the mental capacity to fit into our highly organized and complex social and industrial systems, and, failing to measure up to the required standards of modern industry, they at once become crime possibilities. It occurs to me that society must eventually cease to consider only the effects of crime, and must make an intensive study of the conditions which make for crime, and by removing the cause strike the major problem at its roots. I have not, as a pioneer in this approach to the general problem of police administration, been able to demonstrate very many of my theories, but those that

Punishment Alone Will Not Prevent Crime

Lack of appreciation on the part of most chiefs of police of the importance of crime prevention activities—or lack of funds with which to conduct them—is evident from an examination of the statements from a hundred or more cities quoted in the report of the New York State Bureau of Municipal Information, from which the accompanying article has been compiled. One chief of police, with perhaps unconscious humor, writes:

"We have about the same as most departments. Officers are doing what they can to prevent crime, nothing special being done."

Another guardian of the public safety, who evidently is not a student of modern sociology and psychology, seems to put his faith chiefly in gas bombs, shotguns, and drastic punishment, his creed being that "most criminals are natural-born crooks, and it's the fear of punishment that keeps them within bounds."

And just as the most efficient fire chiefs are endeavoring to stop fires before they start, so there is a slowly growing appreciation among police chiefs of prevention before the deed as being at least as important as punishment after the deed in dealing with the problem of crime in our cities. A few letters from such forward-looking officials are here quoted.

I have demonstrated have at least proved to me that I am not a dreamer, and I congratulate those municipalities, and more especially those police organizations, which are moving out into larger fields of constructive effort and whose personnel have richly sensed that we are our brother's keeper.

H. E. FRENCH,
Chief of Police.

A Juvenile Squad

HAMTRAMCK, MICH.—It is the belief of the undersigned that to actually get at the root of the crime situation one must begin with the juvenile. This department has, in connection with the ordinary police work, a juvenile squad who devote their entire time to looking after the welfare of the younger sex, more especially the young male sex. In connection with this thought of crime prevention, it is my earnest belief that were all members of the police department on the alert to observe conditions tending to indicate the beginning of any situation which may develop into the commission of an unlawful act, and were they to take immediate steps to properly adjust or remedy such condition, or in other words, "nipping in the bud," serious breaches of the law would be prevented and thus terminate *ab initio* a major violation of our laws.

WILLIAM H. BERG,
Chief of Police.

Policewomen and Police Matron

HOLYOKE, MASS.—Social Service work is carried on under the direction of the policewoman and police matron, both of whom are very actively identified with the Day Nursery and various other charitable organizations affiliated with the Family Welfare League.

WM. J. DOYLE,
Police Clerk.

Narcotics and Pistols

LOUISVILLE, KY.—We exert every endeavor to stamp out illegitimate sale of narcotics and to secure convictions for pistol toting. We believe that these two things contribute greatly to crime and lawlessness. We also raid vigorously wherever we have reports that moonshine or other intoxicants are being sold.

ROY W. EASLEY,
Chief of Police.

Dance Halls, Prohibition Enforcement, Etc.

MERIDEN, CONN.—All rooming- and lodging-houses are checked up, all transient persons looked up as far as possible, owners of property requested to bar all rear windows where stores are located. All dances looked over in regard to young girls and boys liable to get in wrong. Lewd women not tolerated for a minute. Prohibition laws enforced as far as possible with the small force we have, as we have only 30 men, including headquarters' officers. Detective bureau and patrolmen, and two motorcycle officers. Children not allowed on street late at night, and parents interviewed when deemed necessary. Welfare association keeps in touch with this department. In fact, we are doing everything we can think of to prevent crime.

WM. D. THAYER,
Captain of Police.

Pool-Rooms and Juvenile Delinquency

BEACON, N. Y.—My men keep an eye on pool-rooms and keep young boys out of them, for, in my opinion, they are the worst places to contend with. We also watch the boys and girls and try not to let them do small things as they soon lead to bigger things. There isn't very much one can do to prevent crime outside of the regular patrol work with wide-awake police officers on the job.

JESSE B. DINGER,
Chief of Police.

Legislation and Citizenship Education

OAKLAND, CALIF.—We are endeavoring to influence legislation through our California Peace Officers Association, for the betterment of laws, especially dealing with criminals and those criminally inclined; cooperating with all civic organizations and other agencies for the betterment of society; strict police regulation of public amusements, licensed and otherwise; active interest taken in all movements for the citizenship education of growing children with public school department; truant officer and juvenile department; continual study of the most advanced and accepted methods of crime prevention throughout the world, and, whenever applicable, method is adopted in this city.

JAMES T. DREW,
Chief of Police.

Aid from the Newspapers

BINGHAMTON, N. Y.—The Department has carried on a crime prevention campaign for over two years. We work along about the same lines as the health and fire departments. We use the newspapers for articles which acquaint people with the law, and the penalty, for violation. Members of our department speak before young people's societies, and public gatherings. The Boy and Girl Scouts have been given considerable attention. We reach the young people through personal contact, and the adults through the newspapers.

WM. T. HUNT,
Chief of Police.

Application of the Golden Rule

BERKELEY, CALIF.—Close supervision of youthful delinquents; voluntary police probation for juveniles without court procedure; endeavoring to mold the pre-adolescents into good citizens; policewoman does social work in broken homes, etc., to correct bad environmental conditions when possible; probation for first offenders and parole for rehabitable felons; general application of "Golden Rule" locally.

C. D. LEE,
Acting Chief of Police.

Helping the Unemployed

PITTSFIELD, MASS.—Every dance hall is covered by a patrolman and paid by the hall owner. Every dance of any kind must secure a permit from the Chief of Police and every dance must be properly policed. There is very close supervision of pool rooms and bowling alleys, hotels and restaurants, and very close watch of all rooming houses, and a careful check of all garages. Safety and prevention talks are given to children and groups of different organizations. We try to secure work if possible for the unemployed. A very careful check is made of all strangers. We are doing a real service work among the poor, cooperation with live organizations in every way possible for the welfare of the adult but especially with the Boys' Clubs, the Y. M. C. A.'s the F. M. T. A., the Girls' League, and the Boy Scouts—in other words, being of real service to the community in which we live.

JOHN L. SULLIVAN,
Chief of Police.

Community Centers Encouraged

CLEVELAND, OHIO.—Every member of the Department is instructed to exercise vigilance and be on the alert in the prevention of crime. It is my contention that if proceedings are used to induce the criminally inclined to pursue some lawful occupation and then keep them under surveillance, probably change of environment, different companions, etc., may appeal to them and make a marked improvement in their whole career. It is, and has been, my judgment that if such proceedings can be used that will prevent crime, far better results can be secured, than by waiting until such time as the violation is committed and then making arrests. We encourage community centers and various other organizations tending to occupy the minds and overcome any suggestion that may come to our children leading to a life of crime.

JACOB GRAUL,
Chief of Police.

Cutting Out Legal Technicalities

WASHINGTON, D. C.—This Department recommends as a means of preventing crime a system of criminal procedure which will provide for prompt trial of criminal cases wherein the procedure will be stripped of the cancerous growth of legal technicalities which at present surround and encumber the procedure and where the question of right or wrong will be the only issue.

EDWIN B. HESSE,
Major and Superintendent of Police.

Traffic Squads and Citizenship

ROCKFORD, ILL.—At each public and parochial school the Police Department has instituted a traffic squad of boys who direct traffic in the vicinity of the school while children are going to and from the school. This means that Rockford has between 200 and 250 boys doing school traffic duty. At intervals a member of the Police Department is sent to the schools to give short talks to these boys and to the school children assembled. The talks to the boys are generally along the lines of their duties, but to the children assembled the talks are along the lines of good citizenship, the duties of children toward the school and the city as a whole, and generally the making of good citizens out of the school children. Teaching school children good citizenship and thus making good citizens out of them certainly is along the lines of crime prevention.

A. E. BARGREN,
Chief of Police.

Aid from Boys' Clubs and Banks

GLEN COVE, N Y.—In the matter of crime prevention work it is rather difficult for a city of our size to do much in this line, as our crime wave is not on such a plane as to require such active work on our part. Every opportunity we get we stress to young men of our community the fact that they should belong to one of the many young men's and boys' clubs in the city. This work has proved beyond doubt that boys kept off the streets at all hours of the night really do not turn to any thought of crime or nuisance. We encourage the boys to come up to Police Headquarters and see how our system works, and many things of interest in this line are constantly brought before the boys' attention. During the Christmas rush hours in this city we recommend that banks stay open until a late hour to receive the funds of merchants doing a very heavy business in the evening, thus allaying any fear of large robberies being pulled off.

JOHN J. McMANUS,
Deputy Commissioner of Public Safety.

Crime Prevention Bureau

DAYTON, OHIO.—This Department maintains a Crime Prevention Bureau in an effort to prevent crime, especially among juveniles. This Bureau inspects parks, playgrounds, pool-rooms, etc., investigates complaints concerning juveniles, and the like. In addition, we keep a close check on all pardoned and paroled prisoners from various penal institutions in an effort to keep them on the straight and narrow path.

R. F. WURSTNER,
Chief of Police.

Realtors Endorse Zoning Against Billboards in Residential and Scenic Districts

THAT billboards out of their proper place are coming to be recognized as distinctly harmful to property values, and that the exclusion of billboards from residential and scenic districts now has the powerful support of the National Association of Real Estate Boards is emphasized in a recent forcible editorial in the *National Real Estate Journal*. To quote in part:

"The injury to property values which comes from the inclusion of billboards in a residential neighborhood or in a scenic region comes upon them from the fact that they are offensive or annoying to great numbers of people. That is to say, the principal objection to billboards is fundamentally an esthetic objection.

"This is true despite the improvement in artistic designing which outdoor advertising has made in the past few years, and it will be true permanently, however far outdoor advertising may go in becoming a true art. The indictment against the billboard that is out of place is not that it is an advertisement and it is not that it is in itself ugly, but merely and simply that it *is* out of place.

"It is possible to imagine advertisements in many locations in business districts so well placed and so well designed as to be an actual improvement to their surroundings. Realtors are agreed that no billboard can be that if it is placed in a residential neighborhood or in a region whose principal appeal is its unusual natural loveliness. Moreover, they hold that the beauty which has been created by human effort in the designing of residence streets is a public asset, and as such should be preserved for public use under the police powers. The principle would apply also to the great public asset which exists in the restful beauty of country roadways."

Forward Steps

Reported by Municipal Officials, Chamber of Commerce Executives and Others

Helping Miami to Bloom Again

MIAMI, FLA.—This city is in the midst of a "Better Lawns and Flowers" contest, in which scores of beautiful lawns and gardens, the pride of Miami home owners, have been entered in competition for the cash prizes to be awarded under the direction of the Miami Junior Chamber of Commerce. The prize fund was subscribed to by local merchants, and prize degrees will be awarded under the names of the respective donors.

There is no entry fee for the contest. The development and upkeep of the plots is to be handled completely by the entrant; no lawns attended by landscape architects or paid gardeners can be entered. The prizes will be awarded on the basis of the improvements attained during the life of the contest, which will close on March 31. Committees of the Miami High School Student Chamber of Commerce make regular inspections of the lawns and gardens entered and keep a progress rating sheet on each.

This contest is the culmination of a beautification campaign which was promoted and sponsored by the Junior Chamber of Commerce as a result of a suggestion by the City Manager. After Miami had recovered from the first shock of its disaster of last September, and the streets were cleared and repair work on damaged buildings was begun, the background of the picture was found to lack something—and that was realized to be Nature's artistry in flowers and shrubs. So a "Colorful Miami" movement was advocated.

To open the campaign, the Mayor declared Armistice Day as Miami Arbor Day. The Junior Chamber of Commerce, in cooperation with the associated patriotic societies and the city Park Department, arranged a program that commemorated those lost in the storm and at the same time offered an expression of appreciation of the sympathy and help received from all parts of the country. The most majestic feature was an impressive ceremony in Bay Front Park. The Armistice Day parade, headed by the American Legion, turned into the park, and there, spread before the eyes of the crowd assembled, was a huge landscape reproduction of the map of the United States, each state clearly outlined with shrubs. Forty-eight young women, former residents of as many cities throughout the country and then living in Miami, came forward and each planted a shrub in the location of her respective home city. The names of the cities were indicated by lettered markers. After the planting, the young women advanced simultaneously to the Florida peninsula, where they presented bouquets of flowers to forty-eight representatives of the civic and service organizations of

CEREMONY IN BAY FRONT PARK, MIAMI, WHEN THE LANDSCAPE REPRODUCTION OF THE MAP OF THE UNITED STATES WAS PLANTED WITH SHRUBS

Miami, each of whom in turn planted a shrub as a token from his particular organization. Moving pictures were taken of the entire program. The "map" is now in full bloom, each state a mat of a different colored flower.

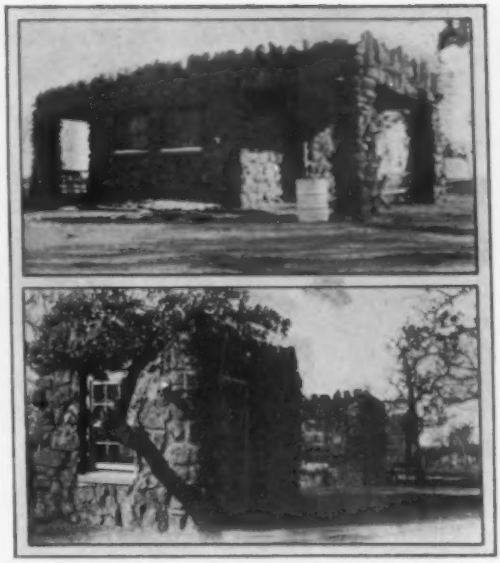
Many schemes were followed to keep the idea of "Colorful Miami" before the people. Telegrams reminding the members of the service clubs of their responsibility in the program were read each week before the club meetings. A "Better School Grounds" week was held, during which representatives of the women's clubs spoke to the assembled student bodies of forty public schools. One hundred pounds of flower seeds, divided into 35,000 small packages, were distributed from house to house by Boy Scouts, to encourage the planting of quick-blooming flowers. The Park Department gave away thousands of shrubs to individual home owners, and numerous quick-blooming flower sprouts were nurtured at the city's greenhouse and made available for free transplanting.

The representatives of the local garden clubs and women's organizations divided the city into sections and cooperated to the fullest extent in the comprehensive planting program. Local newspapers gave liberal space to the beautification publicity, and one of the signboard companies fell into line by spending a considerable sum in landscaping in front of its signboards.

A deputy office of the American Tree Association has been established in the City Manager's office, where all persons who have actually planted a tree (not a shrub) in Miami either before or since the hurricane, can make application and receive an engraved certificate of membership in the Association. There is no entry or membership fee. This membership drive is being particularly encouraged at this time because the Miami Junior Chamber has challenged all southern states to an American Tree Association membership contest, which closes on March 31.

Meanwhile the hand of Nature has been at work and Miami is blooming forth again as a tropical garden.

PAUL B. WILCOX,
Assistant City Manager.



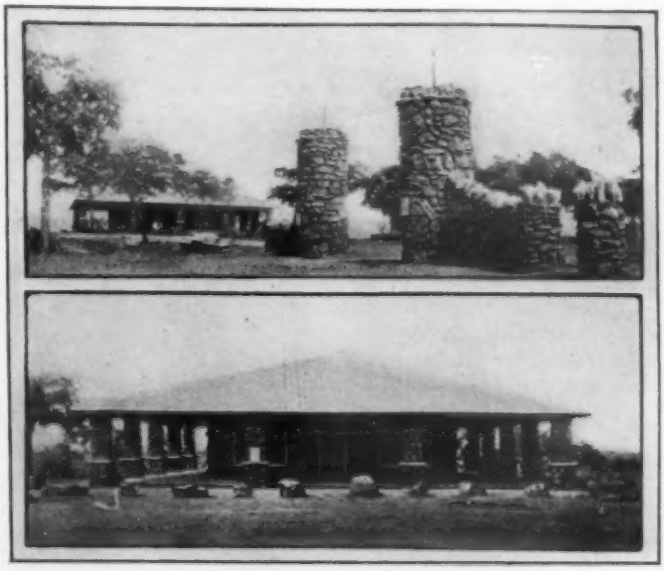
ONE OF THE CAMP KITCHENS (TOP) AND A ROW OF CAMP COTTAGES, TOURIST PARK, EASTLAND, TEXAS

A Tourist Camp to Be Proud Of

EASTLAND, TEXAS. — With the opening up of the Bankhead Highway, an attractive scenic route across the continent passing through the city of Eastland, our City Commissioners realized that a tourist camp would soon be needed in this section to take care of the many autoists traveling over the new highway. Without delay they purchased an eighteen-acre site on a hill overlooking the city, and drew up plans for the construction of a modern, well-equipped camp. The selected tract of land, being only twelve blocks from the business center of Eastland and directly on the Bankhead Highway, was an ideal site for the purpose.

The camp buildings which are now completed and in use include a community kitchen, cottages, garages, a comfort station, toilets, etc. These were all erected with pieces of native red sandstone covered with green moss, and are cemented with black mortar. The buildings are therefore not only fireproof but colorful and artistic in appearance.

The comfort station, located near the entrance to the camp, has four hot and cold shower-baths, two toilets, two lavatories, urinals, dressing-rooms, etc., as well as a large reading-room and library. The water and sewer lines are connected with the city system. The building is equipped with up-to-date electrical fittings and has a radio connection. The office of the Camp Superintendent, who is a member of the police force, is also located in



TOP.—ENTRANCE GATE TO THE TOURIST PARK IN EASTLAND.
BOTTOM.—COMFORT STATION IN THE PARK

this building. One of the Superintendent's duties is to secure the registration of all tourists patronizing the camp.

The community kitchen is located near the center of the camp grounds and is furnished with modern cooking equipment. Standing on a concrete pedestal are twelve natural-gas hot plates, and around the room on all sides is a built-in table with concrete top. There are also two built-in kitchen sinks. The kitchen is entirely sanitary, having a concrete roof and floor and tiled walls. Electric plugs have been installed for the use of those wishing to use electric irons.

The cottages are scattered over the grounds and each is so situated as to command a good view of the surrounding country and to get the benefit of the cool breezes in the summer months. All are furnished with gas stoves, beds, and tables, and are of fireproof construction. A children's playground has been laid out, and play apparatus, such as swings, horizontal ladders, etc., provided. Adjoining the playground is an attractive rose garden. The camp grounds are liberally planted with native oaks, affording welcome shade. The annual mosquito control work in this section keeps the camp free from this nuisance.

The entire control and management of the camp is in the hands of the city, the rules and regulations being enforced through ordinances.

From the comments received from autoists who have visited our city during the last twelve months, we have reason to believe that our camp is one of the finest in the South.

W. E. DAKAN,
City Secretary, Eastland, Texas.

Canton's Civic Center Opportunity Creates Interest

CANTON, OHIO.—Seldom has an opportunity come to any city—short of a catastrophe making general rebuilding necessary—such as is now presented to Canton for the creation of a modern civic center in which may be located all the city's public buildings.

By the natural processes of growth, making demand for enlarged facilities, and by obsolescence and decay of existing structures, need comes simultaneously for a Federal Building, a County Building, a City Hall, and an office building, possibly also for the replacement of the public auditorium and provision for a safety building.

Grant for a Federal Building already has been made. Under the prevailing system this building must be a separate structure, and it may not be possible for the county and city commissioners to direct its placement. It is possible, however, for county and city authorities to work together and thereby secure a grouping which will effect a civic center—and this is the present aim.

In preliminary sessions of the County Commissioners with the Municipal Building Commission of Canton, the county-seat of Stark County, a resolution has been adopted approving the civic center plan, the objective being to locate county and city buildings on the same or adjoining sites or to utilize the same site in a joint County-City Building. Both the Court-House and the City Hall are in the very center of the city, surrounded by business and office structures. The property occupied is valuable and possibly could be sold for enough to provide not only new sites but also most of the sums needed for building.

Not far distant from the present buildings is a home site of six acres, the estate of a pioneer, which could be acquired at slight cost for the creation of a Civic Center Memorial, but this breaks the downtown tradition and arouses selfish interest in opposition. In securing the necessary county cooperation, because Canton is only a part of the county, it may not be possible to carry the public vision far enough ahead to get away from the congested center. Other sites are available which will meet outstanding needs and still preserve the civic center idea, which is the chief objective. Study is now being made, and recommendation for procedure, asking approval by the voters of the county and the city, is expected to come within a few months.

CHARLES E. MORRIS,
Publisher, *Canton Daily News*, and member, Municipal Building Commission.

School Dental Hygiene—Peoria's Program

PEORIA, ILL.—Dental health education in the public schools has a definite value, and no school system, large or small, can afford to be without it in some form. Dental education is not a luxury. It is a necessity—a prerequisite to good citizenship. Each room in every grade school should have a definite dental health program. Such a program need not take up an unreasonable amount of time of either teacher or pupil, but at least one month of every school year should include a project that will stress the importance of a clean mouth and care of the teeth. It is not so important that a pupil know the anatomy of the mouth and teeth as it is to know why and how to keep the mouth and teeth in good repair.

A very large percentage of absences from school are caused by toothache, or by some condition that had its origin in the mouth. According to statistics compiled by Dr. Edward H. Smith, of Libertyville, Ill., there were 114,964 repeaters in the public schools of Illinois at the close of the school year 1923-1924. Of this number 65 per cent were repeaters from preventable causes, and 45 per cent of this 65 per cent were repeaters from causes directly attributable to dental defects. In many schools where a high appreciation of dental health prevails, it has also been found that incorrigibility can in many cases be attributed to lack of dental care. In the public schools of Bridgeport, Conn., where an extensive dental health program has been in successful operation for many years, statistics have been compiled which prove that as a result of this program there has been a reduction of 50 per cent in the number of children failing to pass their examinations—a saving to the taxpayers of thousands of dollars—and the moral tone of the city's entire educational system has been improved.

For the last ten years a dental health program has been carried on in the public schools of Peoria, Ill. Its main object is to encourage clean mouth habits, to develop an appreciation of the proper care of the teeth, to teach the right use of the tooth-brush, and to keep the child comfortable so that he can reap the full benefits of his educational opportunity. Prevention rather than repair is the keynote. Only the simplest service can be rendered in the school dispensaries, the entire trend of the work being educational and prophylactic. The dispensary serves to tide the pupils over until they see the necessity of getting in touch with a private

dentist. It helps to eliminate fear, and forms a friendship between the child and the dentist.

Dental examinations during the first semester of 1926-1927 in the Peoria public schools included all the pupils in the first four grades in twenty-one grade schools. In one school the pupils in all grades were included. A total of 4,170 pupils were examined. Of these, 265 were already being cared for in the dispensaries by the school dentist; 429 who had dental defects and were unable to pay for private dental service were given application cards for free service in the school dispensaries; and 902 were found to be under the care of their own dentists in private practice. Over 3,000 notices were sent to parents calling attention to dental defects. The conditions found in the mouths of many children were so extreme that the pupils would unquestionably have been unable to make their grades without the services rendered in the dispensaries.

The total cost of the dental department for that semester was $2,750. Of this sum, $1,450 covered the cost of operating the dispensaries, including salaries of the staff, during the sixty-three days of actual service. The balance, $1,300, represents the expenditure for dental examinations and educational projects in the twenty-one grade schools during the remaining days of the term. The expense of these dental activities cannot be looked upon, however, as an additional burden on the school budget. It has been estimated that the work of the department reduced by forty-eight the number of pupils failing to pass their grades, representing a net saving of $1,862.30 to the taxpayers. But of greater importance than any financial saving is the improved health of the children and their subsequent increased efficiency in scholarship.

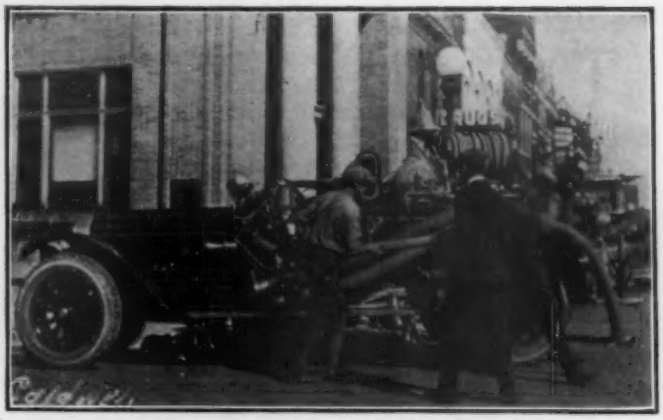
C. CARROLL SMITH, D.D.S.
Public School Dentist.

Motor Pumper Quickly Pays for Itself

MARSHFIELD, WIS.—The purchase of the American-La France motor pumper shown in the accompanying illustration has proved to be one of the best investments ever made by the city of Marshfield. Shortly after it was placed in operation, the pumper made it possible for the Fire Department to save a $25,000 residence from complete destruction. The fire was discovered on the roof of the home on a windy morning, and had presumably been started by a spark from a chimney igniting the shingles. The standpipe pressure was found entirely inadequate to reach the blaze in its early stages, but by the use of the new pumper the flames were extinguished before any great damage had been done by fire or water.

A little later, the pumper again showed its worth. A fire broke out on the upper floor of a box factory located in a two-story frame building half a block long. Because of the inflammable character of both the structure and its contents, the flames spread rapidly, threatening to reach a nearby lumber yard, with subsequent danger to a number of surrounding residences. The pumper was put in operation and ran steadily for four hours. Its powerful streams successfully confined the fire to the second floor of the factory, which had been used for storing cheese-boxes. The first floor was saved entirely, suffering only some water damage to the machinery, and the plant was running again in a few days.

D. A. CALDWELL.



AMERICAN-LA FRANCE PUMPER WHICH HAS PROVED A WISE INVESTMENT FOR MARSHFIELD, WIS.

Town Planning Compulsory in New Zealand

WELLINGTON, NEW ZEALAND.—The subject of town planning legislation, which has been much discussed in this country for some years past, was taken up in earnest by the Government in 1926, and a comprehensive Town Planning Act was passed. Under this new law, which went into effect on January 1, 1927, all boroughs with a population of 1,000 or over are required to prepare a local town planning scheme, a three-year period being allowed for the completion of the work. The position of Director of Town Planning was created and a Town Planning Board established.

Each local town planning scheme is submitted upon completion to the Town Planning Board for provisional approval. This having been secured, the plan is made public in order to give citizens an opportunity to file objections. These requests for modification must be referred to the Board for decision before the plan is amended and final approval granted.

Realizing the difficulties that would arise if a city were, for example, to plan its main thoroughfares without regard for conditions obtaining beyond the city limits, provision has been made for regional planning schemes for rural areas. Under the Town Planning Act, county councils may be called upon to cooperate with the borough councils in preparing a regional plan for the districts under their jurisdiction.

The cost of carrying out the new town planning schemes will be partly met through assessments against landowners, amounting to one-half of any increase in the value of their property that can be directly attributed to the adoption of the town plan. The balance of the necessary funds will be secured by the local authorities under the Local Bodies' Loans Act.

R. B. HAMMOND,
Director of Town Planning, New Zealand.

Information Available from Municipal Administration Service

THE various organizations engaged in municipal research have hitherto lacked a medium for interchange of information. This has resulted in considerable duplication of effort. In the past many surveys have been made and reports written on subjects already covered by others in the field.

To meet this need for a central clearing-house of information, the Municipal Administration Service has been established through the cooperation of the National Municipal League and the Governmental Research Conference. It will render the same service to municipal administration as the National Municipal League has long rendered to the general field of municipal government.

At the request of THE AMERICAN CITY, Russell Forbes, who has been appointed Director of the Service, has prepared the following outline of activities to be undertaken:

TECHNICAL SERVICE TO BUREAUS OF MUNICIPAL RESEARCH

"Bureaus of municipal research will be furnished upon request with a digest of the work done by other bureaus on specific projects. Copies of reports and special material whenever available will be sent out on a loan basis. Original investigations and reports will also be made as our facilities permit.

"Through constant and intimate contacts, we shall keep informed on what all municipal research bureaus are doing, thereby equipping ourselves to be of real service at all times. When any bureau report is issued, we shall be able to notify others interested in the same subject. Thus the influence of the individual bureau will be greatly broadened and the whole municipal research movement will be more closely knit together.

"Individuals or civic bodies interested in establishing a research bureau in their city may secure aid in preparing publicity material and in engaging speakers upon application to the Municipal Administration Service.

INQUIRIES

"Mayors, department heads, or other public officials may call upon the Service for information on budget, purchasing, personnel, city planning, paving, public utilities, public health, education, or any other current and recurrent problem of city government.

"The Service will also be helpful to municipal reference libraries. Librarians may refer inquiries on municipal administration to us for reply or secure from us information with which to assist citizens or public officials on administrative problems.

"Our facilities are at the disposal of taxpayers' associations, chambers of commerce, and other organizations, as well as individuals, interested in municipal administration.

PUBLICATIONS

"The Municipal Administration Service will also edit and publish studies and reports on those phases of municipal administration upon which there is a scarcity of available information. The following among others are being considered as publication subjects:

Policewomen in American Cities
Revision of the Building Code
Traffic Control
Custody of City-owned Buildings and Land
Municipal Cost Accounting
The Photostat Recording System for Official Documents
Preparations for Major Municipal Emergencies
Financing Improvement by Taxation or by Borrowing
Custody and Control of Motor Equipment
Planning and Installing a Street Lighting System
Standardization of Supplies

"The Municipal Administration Service is under the supervision of the following committees representing the National Municipal League and the Governmental Research Conference:

FRANK L. POLK, *Chairman*, President, National Municipal League, New York.
WILLIAM C. BEYER, Director, Bureau of Municipal Research, Philadelphia.
RICHARD S. CHILDS, New York.
HAROLD W. DODDS, Secretary, National Municipal League, New York.
LUTHER GULICK, Director, National Institute of Public Administration, New York.
LENT D. UPSON, Director, Bureau of Governmental Research, Detroit.
HENRY M. WAITE, New York.

"The address of the Service is 261 Broadway, New York City."

The New Denver Gas and Electric Franchise

THE Public Service Company of Colorado has been granted a new twenty-year franchise by the city of Denver. At an election held on February 8, 1927, the taxpayers approved the proposal by a vote of two and one-half to one. The old franchise expired on May 15, 1926, prior to which time the company had tried to secure a renewal, including new service conditions and rate schedules, but had been badly defeated at an election.

The new franchise represents a compromise arrived at between the city and the company, with the Chamber of Commerce taking an active interest. The city decided last March to employ Ray Palmer, consulting engineer, of New York City, as its expert to make a valuation, report on rates, and advise the city in its franchise negotiations. Mr. Palmer has been prominently identified with the electrical industry for many years as a consultant, as Commissioner of Gas and Electricity for Chicago, and until recently as President of the New York & Queens Electric Light & Power Company. He carried on the work in association with A. C. King, consulting engineer, of Chicago, and a large staff of engineers and accountants, an engineer representing the Chamber of Commerce checking the work as it progressed. His report was submitted in November, 1926, and was followed by a series of conferences between city and company representatives, a final franchise draft being arrived at in December.

The valuation is not specified in the franchise, but the rate schedule adopted is reported to be based upon Mr. Palmer's valuation, which was $21,175,000 for electric property and $9,821,000 for gas property, a total of $30,996,000. This contains an item of 10 per cent for going value, and is said to be based otherwise on present production cost. After allowing an 8 per cent return on this value, it was found that the existing rate schedules provided the company with $675,000 excess income per annum. The new rate schedules are designed to eliminate most of this excess.

The old electric rate of 8 cents per kilowatt-hour to domestic consumers was reduced to 7 cents for the first 15 kw. hrs. per month, 6 cents for the next 30, and 5 cents thereafter. Street-lighting rates are reduced somewhat, also power rates. The domestic gas rate is changed from 95 cents per thousand cubic feet to 90 cents; the latter is net to the company, whereas under the old franchise, and during the negotiations, the company paid the city all receipts in excess of an average of 75 cents per thousand. This amounted to $76,285.95 in 1926, and to a total of $1,655,184.34 since 1918. Under the old agreement a franchise tax of $50,000 per annum was also paid; a similar feature is in the new grant, the amount being made $60,000.

The heating value of 400 British thermal units per cubic foot at standard conditions, to which point the company had reduced the gas quality in the last few years, was adopted in the franchise. Under Denver conditions this amounts to about 335 B.t.u. per cubic foot, and is the lowest standard in the country; with the result that the price of gas in Denver, on a heat-unit basis, is high compared to many cities. The gas department of the company, however, was reported to be earning only a small percentage on the value ascribed to it.

The franchise provides that the rates "shall be subject to regulation as provided by law," which is said to permit of downward revision by agreement of the company and the city, and increase only by popular vote as provided by the city charter. The city's Manager of Improvements and Parks has access to the company's books; he may make recommendations to the voters for the regulation of rates.

In the event of the city's developing hydroelectric power in connection with its water-supply, the company agrees to purchase such power at an arbitrated price. If the city determines, upon investigation and upon competent engineering advice, that it is economically feasible to bring natural gas to Denver, the company is obligated to do so within two years after such finding, or pay a penalty of $50,000 per annum; after the first ten years of the franchise this is contingent upon the offer of a 20-year natural-gas franchise by the city.

The new franchise is not exclusive. In regard to street lighting, however, the city is obligated to take service from the company.

Mayor Stapleton, City Attorney May, the City Council, the Chamber of Commerce, the daily papers, and various civic and improvement associations were among those approving the new grant. Some of the leading opponents favored municipal electric development on the South Platte River; and there were objections raised in some quarters not only to various provisions and omissions of the franchise, some of which have been suggested above, but also to the granting of any franchise at all, especially as certain other utilities in Denver were operating without such grants.

New Jersey Holds State-wide Conference on Street and Highway Safety

WITH an attendance of some 300 officially appointed delegates, representing 56 cities, villages, and other governmental units throughout the state, the New Jersey Conference on Street and Highway Safety held an important two-day meeting in Newark February 9-10.

Carefully prepared reports, by committees appointed some months previously, were received on Statistics, Law Enforcement, Public Relations, Traffic Control, and Engineering and City Planning. In the resolutions adopted, the Conference went on record, among other things, in favor of:

The adoption, by the respective police departments, of the National Safety Council's forms for the reporting of all automobile accidents.

The principle of a comprehensive plan for every community, and the creation of local planning commissions and regional planning committees or federations.

No lowering of the present age limit (seventeen years) for the granting of automobile drivers' licenses.

The setting-up of a more thorough system of accident reports, and the securing especially of reliable information as to the number of accidents caused by intoxication of drivers or pedestrians.

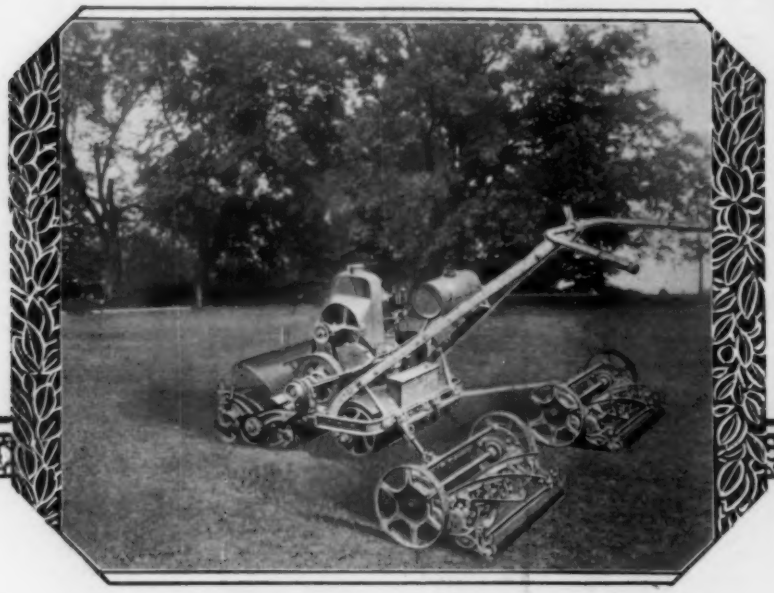
Remedial legislation, based on a study by the New Jersey Medical Society, of the mental and physical fitness of applicants for drivers' licenses.

Legislation for the creation of state-wide traffic courts, so regulated that the fines resulting would revert to the municipalities where the violation occurs.

The creation of an Executive Committee to follow-up the recommendations of the Conference and to call another state-wide meeting when deemed desirable.

New Fire-Resistive Roofing Ordinance

AN ordinance prohibiting the use of wooden shingle roofs throughout the city limits of New York, which has been pending for many months, was adopted by the Board of Aldermen on January 11, 1927, by a vote of 52 to 9, and has been signed by the Mayor. The ordinance provides complete replacement of existing wooden shingle roofs by 1942. Owners of dwellings may make repairs with material of the existing character of their roofing to an extent not to exceed 25 per cent a year. In the opinion of the National Fire Protection Association, the enactment of this ordinance will undoubtedly have a widespread influence in hastening the abolition of the wooden shingle as a roof covering throughout the United States.



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with this general utility motor lawn mower

Perfectly maintained lawns and parkways at a *real* saving!—there you have the outstanding reason for the nation-wide popularity of Coldwell Motor Mower and Roller (*pictured above*).

As a general utility mower and roller it's absolutely *supreme*. Takes care of the large areas as easily and efficiently as the small. Then, too, it trims clean along walks, borders, close up to and around shrubbery and trees.

And it continues the economy of its first cost, in unusual fuel and oil mileage. It's the *one* mower that gives trouble-free service day-in and day-out. Needs no attention while running.

Compare Its Advantages

Coldwell Model "L" is equipped with a full-width drive roller—mows and rolls simultaneously a 25-inch swath. With the gang units attached Model "L's" cutting swath is increased to 60 inches, enabling one man to complete 10 acres of mowing a day on only one gallon of gasoline.

Convince yourself of the superiority of Model "L" by having it demonstrated on your own grounds. See how perfectly it meets your requirements. On request we'll send names of nearest dealer and interesting literature.

Send also for booklet on the Biltmore Hand Mower. The best hand mower on the market—bar none! Pushes easily; cuts quickly and evenly. Timken Tapered Roller Bearings; enclosed gears are run in oil; five keen blades of hardened crucible steel.

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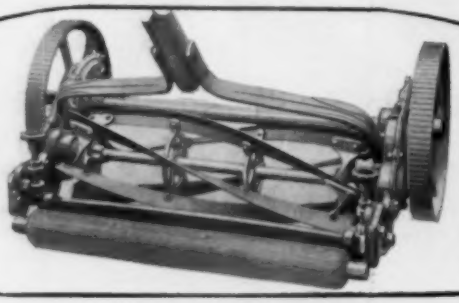

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Municipal Accounting and Finance

Conducted by Francis Oakey, C. P. A.

Member of the Firm of Searle, Oakey & Miller, New York

Sinking-Funds

ONE of the essentials to sound borrowing is the adoption and complete execution of a plan of redemption. In the management of municipal finances no debt should be incurred without such a plan. The provision for redemption must be definite and must assure full and prompt payment of the debt with all possible certainty.

The Danger of Borrowing Without Providing for Redemption

A city borrows money without giving specific security—it cannot pledge its properties. It merely promises to pay. But this promise—provided the loan conforms to legal requirements—is ordinarily as certain of fulfillment as any promise can be, because of an almost certain ability to obtain the necessary funds by taxation. The result is, it is easy for a city to borrow money—also, it is generally easy to refund a loan instead of redeeming it at maturity. Thus all the conditions are present which tend to engender negligence in making definite provision for redemption. So it often happens, in municipal financing, that debt is issued without any plan or provision for redemption and, when the loan falls due, the current revenues are insufficient to meet the obligation and it is necessary to resort to refunding.

A general practice of refunding is sure to result in an unsound financial condition. The borrowing power becomes exhausted and the ability to finance needed public improvements is seriously impaired if not destroyed. The development of essential public works is arrested. Industry seeks more favorable communities, and population goes with it—this means the impairment of taxing power.

The safe and sound policy is to make definite and certain provision for the redemption of every issue of debt.

Redemption Provision Must Be Defined

The provision for redemption must be definite, consisting of a specific plan enacted into law. The law must be mandatory—it must not leave the provision of funds for redemption to the discretion of future executives of legislative bodies. The law should state how, to what extent and from what source the funds shall be provided for redemption.

The provision for redemption must be certain; that is, the funds provided must be adequate, kept intact, and not used for any other purpose, and must be properly safeguarded against loss.

Any provision for redemption which is either indefinite or uncertain might as well be omitted.

The Sinking-Fund as a Definite and Certain Means of Redemption

The sinking-fund is the best method which has yet been devised for providing for the redemption of funded debt. The term "funded debt" signifies debt issued for so-called permanent improvements, and for which a definite distant date is set for payment of the principal.

Such debt is usually large in amount, so large, in fact, that redemption out of the revenues of the year of maturity would be impossible. Moreover, such redemption would be unfair, since it would place upon the taxpayers of one year the burden of discharging an obligation for benefits enjoyed by the taxpayers of a number of previous years.

A sinking-fund, properly established, not only avoids this unfairness but lightens the burden of redemption by spreading it over the whole period of the life of the bonds.

Its most important feature, however, is that it constitutes a definite provision for redemption by the setting-aside of amounts specified by law—the law being mandatory in character. When properly administered, a sinking-fund assures redemption with all the certainty which is possible.

Wrong Kinds of Sinking-Funds

A sinking-fund established on the right basis is one of the most beneficial of all measures relating to municipal finance. When established on a wrong basis, many of its benefits are lost. And yet in innumerable cases legislative bodies have created sinking-funds which violate sound principles. There are many kinds

The Mark of Quality

The Fire Department of Beverly, Mass., is another user of Firestone Tires. Chief Robert H. Grant writes "These Firestone Tires have never caused the least trouble, in fact have never been removed since this apparatus was put in commission in 1924."

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of unsound sinking-funds, but the most common fall into three classes, namely, those which are indefinite as to increments, those for which increments are fixed on purely arbitrary bases, and those which have an additional purpose besides that of redeeming the principal of the debt.

Sinking-Funds Which Are Indefinite as to Their Increments

This is the most common kind of unsound sinking-fund. Its resources are generally derived in part from a special tax levy and in part from various sources, for example:

1. The amounts of certain license fees or certain fines collected
2. Revenues not otherwise appropriated
3. Amounts of a tax to pay interest collected in excess of the interest
4. Proceeds from the sale of public works
5. Unexpended balances of appropriations
6. Percentages of gross receipts of street railways
7. Surplus water-rates
8. Premiums obtained on the sale of bonds

These items, of course, have no relation to the amount required to redeem the debt. Moreover, they vary considerably from year to year—in fact, some of them may cease to exist. The result is that, when increments of this kind are applied to a sinking-fund, the provision for redemption is indefinite; it may result in an inadequate fund or one in excess of true requirements. Either of these conditions is unsound; when a sinking-fund is excessive, revenues which might have been expended beneficially have been unnecessarily hoarded.

When a sinking-fund is established on such an indefinite basis, there is no assurance as to certainty of the provision for redemption.

In the case of a sinking-fund in which the increments are derived in whole or in part from a special tax levy, an additional element of indefiniteness and uncertainty exists unless the practice is consistently followed of providing for uncollected taxes by appropriation.

Sinking-Funds for Which the Increments Are Fixed on a Purely Arbitrary Basis

A sinking-fund may be definite as to its increments and still be unsound. An example of this type is the kind for which a fixed sum is provided as an increment by an appropriation on an arbitrary basis. When such fixed sums are purely arbitrary, they do not represent the installments which are required for redemption; if invested and accumulated, they generally fall short of or exceed materially the amount of debt to be redeemed.

We know of an instance in which an arbitrary amount was set aside as a sinking-fund when a bond issue was authorized, no provision being made for any subsequent installments. With compound interest this fund will fall far short of the amount required for redemption. Under such a plan additional increments would have to be provided subsequently.

When the increment consists of an arbitrary, fixed sum, the sinking-fund is clearly unsound; but if the fixed sum is determined by a calculation of the annual installment which is actually required in contemplation of a normal rate of interest, then the sinking-fund is based on sound principles.

Sinking-Funds Which Have an Additional Purpose to That of Redeeming the Principal of Debt

This is a very common class of unsound sinking-funds. Such funds are established not only to redeem the principal of debt, but to pay interest on debt also. The result is that disbursements for interest are made from the fund at least twice and often a number of times each year. This constant reduction of the resources of the fund upsets and retards the process of accumulation—and sometimes does so at an irregular rate which cannot be foreseen and estimated with accuracy, so that the annual increment which is really needed for redemption is not easy to determine. In the case of such funds the problem is often still further confused by the fact that the increments are indefinite and cannot be estimated in advance.

It is practically impossible to determine whether such a fund is adequate or excessive until the date of the maturity of the debt is near at hand.

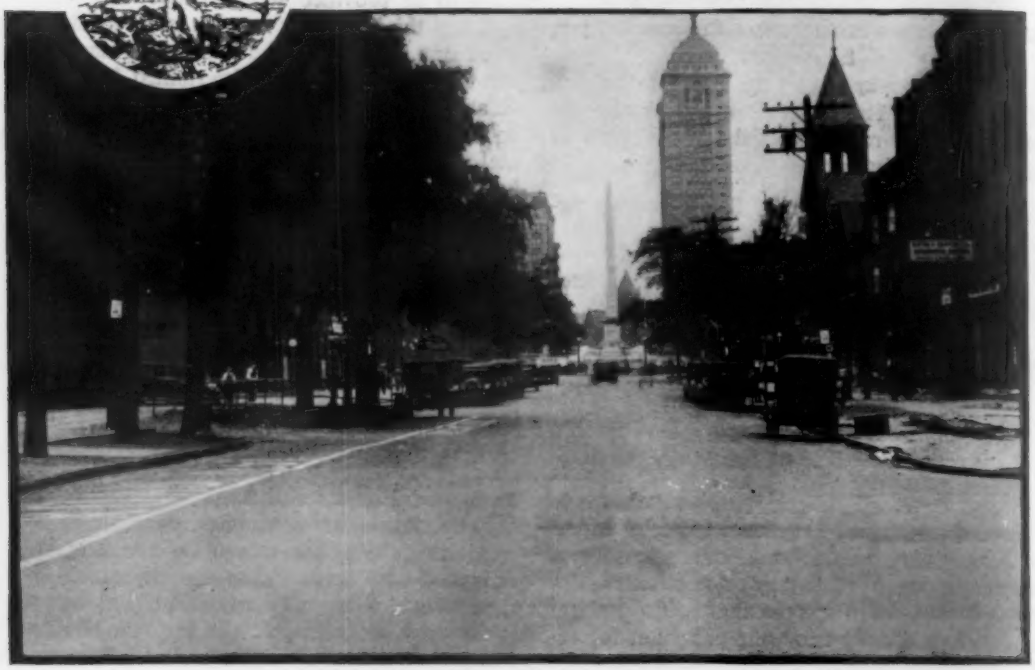
The Right Kind of Sinking-Fund

There are a few fundamental principles upon which a sinking-fund should be based, namely:

1. The basic increment should be provided by an annual appropriation from the general fund
2. The amount of the appropriation and increment should be that sum which, if transferred to the fund each year and invested at a normal rate of interest (say 4 per cent), would with the accumulations of interest equal the amount of the debt to be redeemed at the date of its maturity
3. There must be no reductions of the fund other than the final disbursement to redeem the debt—in other words, the fund should be established for the redemption of the debt and for no other purpose
4. The date of transfer of the increment each year from the general fund should be fixed in advance.

By providing the required annual increment to the sinking-fund by appropriation from the

From Trinidad Lake to Buffalo, New York



It's a long time since 1890!

But through all the 37 intervening years, the Trinidad Native-Lake Asphalt pavement on Court Street, Buffalo, N. Y., has been giving year after year of service *with practically no expense for maintenance.* And it is still in excellent condition, as this recent photograph of the section between Upper Terrace and Seventh Streets shows.

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TRINIDAD LAKE ASPHALT

general fund, the provision for redemption is made as definite and certain as possible. Moreover, by this method the exact amount required to produce the necessary accumulation can be determined, set aside and invested. The result is that the accumulation of an adequate but not excessive fund is assured.

By confining the purpose of the fund to redemption of the principal of the debt, no reductions occur for other purposes, such as interest, and the necessary accumulation proceeds in a regular and consistent manner.

The reason for fixing the date of the annual transfer from the general fund is that investment at regular intervals is essential, in order to produce the accumulation of interest anticipated as a part of the increment to the fund.

The Management of Sinking-Funds

The establishment of a sinking-fund consists in the formulation and adoption of a definite plan for providing resources for the redemption of debt. Good management of a sinking-fund consists in carrying out the plan to the letter, which means:

1. Appropriating each year the amount specified as the required annual installment
2. Transferring the amount appropriated to the fund on the specified date
3. Investing the amount promptly in the soundest securities (usually the securities are prescribed by law) which yield on the average the rate contemplated in fixing the amount of the installment
4. Reinvesting promptly the income derived from the securities
5. Effecting diversification in the securities purchased
6. Maintaining safe custody of the securities
7. Maintaining complete and accurate records and accounts, of the sinking-fund

Sinking-Fund as Part of Financial Program

Sound financial management is founded on the formulation, adoption and execution of a program, including a program of expenditure and a program of financing. When the program of financing includes the borrowing of money, it must also include a plan for redemption. If the debt issued is of long term and large in amount, the plan of redemption consists in establishing a sinking-fund on a sound basis. Thus the sinking-fund becomes an important feature in the budget.

—*Copyright, 1927, Francis Oakey.*

Road Improvements Reviewed by Bureau of Public Roads

FEDERAL Aid road projects completed during the fiscal year 1926 contributed a net addition of 9,417 miles to the mileage of improved roads in the Federal Aid system, according to the annual report of the U. S. Bureau of Public Roads of the Department of Agriculture. Added to the mileage improved with Federal assistance in previous years, the above brings the total of improved Federal Aid roads up to 55,902 miles.

At the close of the year construction was in progress on 10,962 miles, and projects involving the improvement of 2,469 miles additional had been approved. Including the mileage of projects in these later stages, all of which are included in the Federal Aid System, the total mileage improved or in process of improvement with Federal Aid was 69,334.1 miles. With the exception of a few hundred miles improved prior to the designation of the Federal Aid Highway System in 1921, all of this mileage is included in the system.

The system now has an aggregate length of 182,134 miles. This mileage has been selected by the state and Federal highway officials as essential links of a system adequate for the accommodation of interstate traffic. Considerable work has been done on the system by the states without Federal aid, so that now it is not far from three-fourths initially improved. The work of improvement, however, is not three-quarters done, as increasing traffic will make it necessary to improve to a higher degree considerable mileage of low-type roads—graded earth, sand-clay, and gravel.

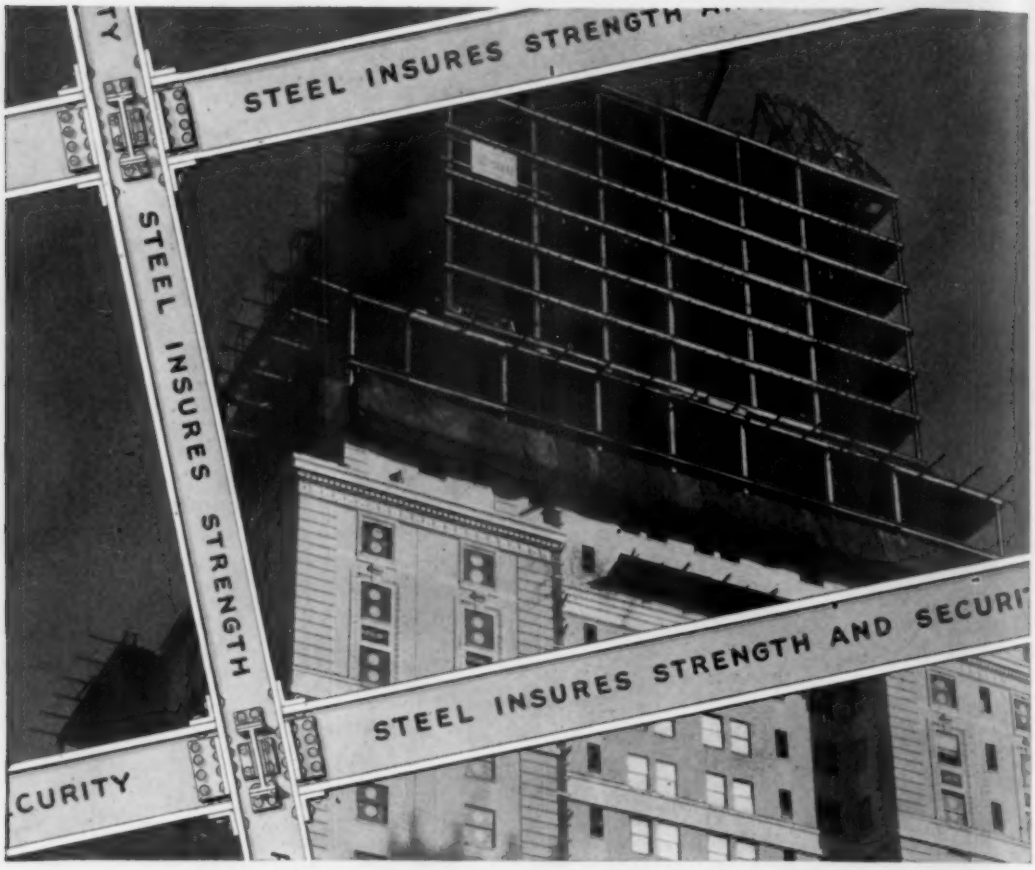
Twenty-five states have continuously improved highways entirely across them in at least one direction, and sixteen of these have completed state arteries in two directions.

No "Saturation Point" Yet in Low-Cost Housing

FROM data supplied by 88 cities and towns throughout the state, the Pennsylvania Housing and Town Planning Association estimates that the housing shortage in the state at the close of the year 1926 was less than one-tenth of what it was in 1924, when 50,000 homes were needed to balance the supply and demand.

The market for homes selling at $8,000 to $10,000 and over appears to be approaching the saturation point, and cheaper homes must now receive attention of builders if normal construction is to continue. This is evident from the fact that 80 per cent of all towns surveyed report a popular demand for homes to sell for $5,000 and under. Literally thousands of families who have been forced to "double-up" with others or "take rooms" in overcrowded dwellings are now in the market for homes if prices can be adjusted to fit their limited incomes.

A big help to purchasers of homes in Pennsylvania is the increasing number of Building and Loan Associations. More than one-third of all these 12,403 associations in the United States are located in that state, which now has a total of 4,461. Of the 88 municipalities considered in this survey, only 15 smaller towns are still without such financial assistance to home buyers. These associations, with their sound and economical business methods, have been rightly called the poor man's banks.



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This advertisement is published by the American Institute of Steel Construction, a non-profit service organization of 218 members comprising the structural steel industry in the United States and Canada. Contributing also to the educational fund are these great rolling mills: Bethlehem Steel Company, Inland Steel Company, Jones & Laughlin Steel Corporation, Scullin Steel Company. The purpose of the Institute is to extend the use of structural steel in construction work of every size and type, from residences to skyscrapers and bridges. The Institute offers fullest co-operation with architects, engineers, the public and all branches of the building trades. Correspondence invited. Address: Lee H. Miller, M. Am. Soc. C. E., Chief Engineer, AMERICAN INSTITUTE OF STEEL CONSTRUCTION, Inc., 285 Madison Avenue, New York City.

The City's Legal Rights and Duties

Conducted by A. L. H. Street, Attorney at Law

The City's Problem of Garbage Disposal

IMPORTANT among the many problems in the administration of a thickly populated municipality is the matter of garbage disposal. In olden times it was a simple matter to cast the waste residue of food into the streets and leave it to dogs, swine, horses and cattle to reduce it. But "that sort of thing is not being done any more." Wherefore, the courts are frequently called upon to adjudicate various phases of municipal efforts to dispose of garbage, for it seems that no one has yet devised a means of collecting, transporting and consuming this waste matter that is universally satisfactory. Particularly difficult is it to find a location for a piggery or an incinerator where the neighbors extend welcome with open arms. There is but one point on which the citizenry agree, and that is that the piggery, reduction works, or incinerator should be operated on the other side of town.

Naturally, as was noted by the Maryland Court of Appeals in one case (115 Atlantic Reporter, 43), "On one hand, we have involved what is alleged to be the health of the communities near where the garbage was to be placed, and, on the other hand, we have a large city, with many tons of garbage to be disposed of, and the comfort, safety, and health of its citizens require the garbage to be collected and disposed of in some proper way."

All the courts agree that neither a city nor its contractor will be permitted over objection of an aggrieved person to unnecessarily cause injury to adjacent property or annoyance to the occupants. It appears to be equally well settled that if substantial injury or annoyance results, despite careful operation of a garbage disposal system, the aggrieved parties are entitled to a fair award of damages, although they may not establish ground for an injunction.

In the case of Block vs. Mayor and City Council of Baltimore, 129 Atlantic Reporter, 887, it was decided that a nuisance abatable by injunction may consist in the transportation of garbage in open scows. In that case the Maryland Court of Appeals observed:

"The general welfare clauses and provisions of the city charter, authorizing it to take such steps as may be necessary to promote the welfare of the city, to insure the security of its inhabitants, and to protect the public health, can scarcely be pointed to as authority for the operation for profit by a private corporation, wholly independent, of a plant outside of the city limits for reducing and disposing of the garbage and dead animals produced in the city, in such a manner as to create imminent danger of disease and pestilence, in the community in which it is located, to affect the health and comfort of the inhabitants thereof, and to deprive them of their right to the quiet, comfortable, and usual enjoyment of their property. If the Legislature had meant to grant a power so important and oppressive, it would have done so in clear and explicit terms, and would not have left it to vague conjectural and speculative inference. It may be conceded that such a power might become necessary to secure the public health and welfare of the inhabitants of the city, but in such a case the Legislature, upon being satisfied of the necessity therefor, could not grant it without making suitable provision for the protection of private rights."

From the official syllabus of the Georgia Supreme Court in the case of City of Quitman vs. Underwood, 96 Southeastern Reporter, 178, it appears that the Court recognized the general rules that where a nuisance arises from the method of operating a plant, rather than from inherent conditions, an injunction will not lie to prevent construction of the plant; and that, ordinarily, delays in objecting to the erection of a structure waive objection to the structure itself. But in this case it was held that an injunction against completion of an incinerator close in town was proper on proof tending to show that there were more suitable locations, that the plans for handling the garbage would endanger the health of nearby dwellers, etc., although the complainants waited until two days before the plant would have been completed before filing suit.

In the case of Swanson vs. Bradshaw, 187 Southwestern Reporter, 268, it appeared that defendant maintained a piggery on a tract near Springfield, Mo., feeding garbage collected by him under contract with the city. Granting an injunction against continuance of the nuisance, the Springfield Court of Appeals said:

"It is true that the garbage of the city must be taken care of and that defendant is engaged in a lawful business. The evidence shows, however, that by some increased expense this garbage can

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be disposed of in a far more safe and sanitary way. The health officers of the city, both by report to the city and by oral evidence, pronounce the present method as improper and unsanitary. Even if defendant was using an approved method and was disposing of the garbage in a careful manner, this fact would not justify his interference with the reasonable and comfortable enjoyment by another of his property or his causing material injury thereto."

That the damaging of nearby property through the establishment and operation of a municipal incinerator of garbage constitutes a "taking" of the nearby property for public use, within the constitutional guaranty of compensation, was affirmed by the North Carolina Supreme Court in the case of Dayton vs. City of Asheville, 115 Southeastern Reporter, 827.

Items of Municipal Law

Power to Annex Territory to Cities, and Limitation of Right to Tax

The power of a state legislature to provide how municipal boundaries shall be extended was recognized by the Iowa Supreme Court in the recent case of Wertz vs. City of Ottumwa, 208 North Western Reporter, 511. It was further noted that, in the absence of constitutional limitation, boundaries may be extended without the consent of either the municipality or the territory to be annexed. But the Court denies the right to tax for general city purposes territory deriving no benefit through being within the city limits.

Vested Rights Acquired by Billboard Owners

Unless a structure imperils the public safety, health, morals, or welfare, it cannot be abated under an ordinance forbidding its further maintenance, and especially where it was erected under municipal permission. Applying this principle in the case of Cain vs. State, 287 South Western Reporter, 262, the Texas Court of Criminal Appeals reversed a conviction for violating a Galveston ordinance forbidding billboards in a certain district of the city. The Court said:

"Appellant supported overwhelmingly the propositions that said billboards did not add to the fire hazards, did not tend to accumulate filth or promote unsanitary conditions, did not encourage immorality or lawlessness, and that no conditions appeared which would seem to justify forbidding the erection or maintenance of such billboards as within the proper exercise of the police power of said city. It is unquestioned that, as to this appellant, he had acquired a vested and valuable property right in said billboards, under the law, as it existed before the passage of this ordinance, and we think this cannot be taken from him by penalizing him . . . unless by such maintenance the safety, welfare, health, or morals of the community were in some wise jeopardized."

A Court Holds That Irregular Tracts Abutting Upon a Street Improvement Were Not Subject to Assessment on the Front-Foot Rule

Rhode Island Avenue in Washington, D. C., is one of those thoroughfares that, radiating from the National Capitol and obliquely crossing the streets that align with the cardinal points of the compass, create irregularly shaped tracts of abutting land. Nevetherless, when the District authorities improved the avenue by replacing a macadam surface with asphalt pavement, assessment of one-half the cost was levied on the front-foot basis against the abutting property. Under the law of the land, the Court of Appeals for the District of Columbia holds in the case of Johnson vs. Rudolph et al. that the assessment is illegal.

The Court illustrates conditions by referring to a tract having a frontage of 200, but tapering from a maximum depth of 50 feet down to 1 foot. It was observed that a similar improvement of the street on the other side of the property, with resulting assessment on the same basis, would amount to confiscation of the lot.

But the Court distinctly declares in the opinion: "The legality of this method of assessing taxes for local improvements, against property facing on streets which divide uniform city squares, is not questioned when applied to property of uniform depth and of comparatively equal value, and when the assessments are not in excess of the benefits."

Concerning varying policies in different states, the Court adds:

"Some of the states still adhere to the principle that assessments on the frontage basis may be imposed without notice or hearing or without regard to whether the benefits equal the assessment.

"Many of the states, however, following the decision of Norwood v. Baker, 172 U. S. 269, have held in effect that while a special assessment against abutting property implies that the property assessed is actually benefited, the assessment can only be made when such benefit in fact exists and when the amount of the assessment does not exceed the benefits. They also hold that the property owner is entitled to a hearing upon the question whether his property is so benefited. [Citing decisions of the appellate courts of Georgia, Massachusetts, Nebraska, New Jersey, Ohio and Texas.]

"In some of the states there are constitutional provisions which either expressly or by construction are inconsistent with assessments on the frontage basis; or if such assessments are permitted, they are subject to the requirement that they do not exceed the special benefits to the property assessed. [Citing decisions of the appellate courts of Alabama, Arkansas, Minnesota, and Virginia.]

"And in still other of the states, either by express statutory provision or by construction adopted by the courts, assessments in proportion to frontage, while recognized and permitted, cannot be assessed without first giving the property owner a right to be heard as to the existence of benefits, and to have the assessment limited to the amount of the benefits conferred." [Citing Illinois and Indiana decisions.]

For an article by Frank B. Williams, Esq., on "The Progress of City Planning Law during 1926," see The Municipal Index for 1927, pages 89-90

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97 WATER STREET **NEW YORK**

Zoning Notes

Prepared by Frank B. Williams

Author of "The Law of City Planning and Zoning"

From data collected by the Zoning Committee of New York (233 Broadway)

Novel Provisions of a Florida Ordinance

WEST PALM BEACH, FLA.—In the zoning ordinance for West Palm Beach passed October 21, 1926, and scheduled in our Zoning Notes last month, there are the following novel provisions:

Section 5. D. *Loading Space.*—In a commercial district every building hereafter erected on a lot having frontage on an alley less than 24 feet in width, shall have on such lot a loading space for the loading and unloading of commercial vehicles serving such building. Such loading space unless adequately provided for in a location approved by the zoning board of appeals shall be located along all such alley frontage that is distant more than 80 feet from an intersecting street and shall extend for a distance of not less than 10 feet back from such alley line with a clear height of at least 14 feet above the alley grade. For buildings of limited loading space requirements, the zoning board of appeals may on application after public notice and hearing modify or waive the above loading space regulations.

Section 12. *Subdivision Plan.*—In submitting to the city planning commission for approval a plat of a proposed subdivision of a tract of land 10 acres or more in area, the owner or owners of such tract may submit to the said planning commission a proposal for a modification of the zoning of such tract for the purpose of correlating the zoning regulations with the street, block and lot layout and proposed building development within such subdivision. The allotment of area for business use shall not be approved by such commission unless the proposed platting provides adequate space for the loading and unloading of vehicles and for the parking of vehicles in connection with such business use and for such corner cut-offs or setbacks as will prevent traffic difficulties and safeguard adjacent residence areas. The modification of yard, lot area, lot width, percentage of lot occupancy, and apartment house regulations shall not be approved unless for the development as a whole, and taking into consideration any permanent open spaces or building restrictions provided in the platting, the housing standards will not be inferior to those prescribed by the existing regulations. Such prosposed modifications, if approved by the planning commission and after public notice and hearing by the zoning board of appeals shall be construed to vary the regulations of this ordinance as related to the land included in such subdivision.

Buffalo Zones for "Vision Clearance"

BUFFALO, N. Y.—The National Association of Real Estate Boards, in its *News Service* for December 24, 1926, in comment upon the recent Buffalo zoning ordinance, says:

"Vision clearance" restrictions are a feature of the zoning ordinance recently adopted by the city of Buffalo, N. Y. The restrictions apply to fences, walls, shrubs, etc., as they may occur at street corners.

"Another notable provision of the Buffalo ordinance is that for a possible lessening of some of the restrictions, after public notice and a hearing, whenever the owners of any tract of land not less than 2 acres in area submit a plan for a residential development, and a lessening or elimination of rear-yard requirements when recreational areas are dedicated in perpetuity to the use of residences on the plot. In this case it is provided that such recreational area must be at least 10 per cent of the area of the entire tract, 40 feet or more in least dimension, and having a total area of 10,000 square feet. This provision, the National Association of Real Estate Boards points out, is of especial value in encouraging the dedication of community play space as part of the development plan for a residential subdivision.

"The Buffalo ordinance also provides for a lessening or entire waiving of side-yard requirements provided there be unimpeded access to such recreational area."

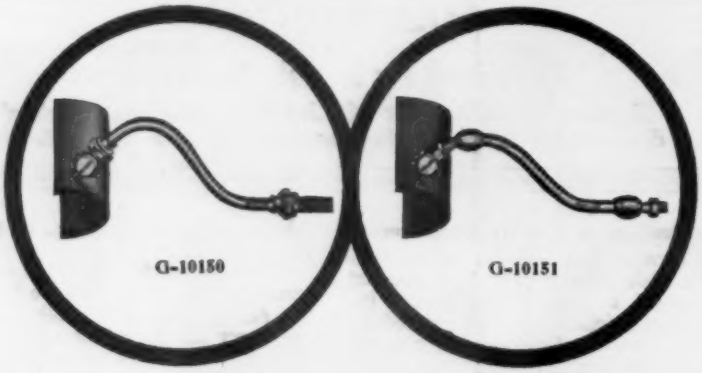
Recent Zoning Decisions

MASSACHUSETTS.—*Viano v. Chandler* (*Supreme Court*), January 28, 1927. A member of the Board of Appeals which granted a petition is financially interested in the matter, being associated with the firm of architects who drew the plan, and receiving a part of the commission. Hence the order of the Board granting the petition is void.

NEW JERSEY.—*Contras v. Mayor and Aldermen of Jersey City* (*Supreme Court*), 135 Atl. Rep. 472. The refusal to grant a permit for the erection of a building which would increase the fire hazard is within the police power of a municipality.

NEW JERSEY.—*Gibbs Building and Construction Co. v. Town of Belleville* (*Court of Chancery*), 135 Atl. Rep. 333. In view of P. L. 1924, p. 327, Sec. 7, and P. L. 1926, p. 527, Sec. 2, after an appeal was taken to the Board of Adjustment from the refusal of the town building inspector to grant a building permit, and until the Board had disposed of the appeal by some official action, a permit could not be issued and if issued, was void.

NEW YORK.—*Hall v. Walsh et. al.*—Writ of certiorari dismissed and determination of Board of Appeals confirmed, with costs. The Board, having decided an appeal, has no power to open the matter and rehear it upon the same facts (People ex rel.. Swedish Hospital v. Leo, 120 Misc. 355, aff'd 212 Supp. 897; McGarry v. Walsh, 213 App. Div. 289). When, however, a new appeal comes to the Board from a new ruling, the matter must be passed upon. I am not prepared to hold that in such a case the decision need not consider the prior determination. If the facts and situation were the same in both appeals, the prior decision would seem to be binding and require a similar holding in the later appeal. But if there had been



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a substantial change the matter would be open for a new determination. Whether there was such a change would be primarily for the Board to determine. Here it has so found, and I find nothing in the record to justify a reversal of that finding. Having the power to make its decision, the discretion of the Board in the absence of bad faith may not be reviewed (Boyd v. Walsh, 217 App. Div. 461). I see no suggestion of bad faith here. The application seems a reasonable one and one that could properly be granted.

An Admirable Opinion on Setbacks

OHIO.—*Kaufman v. City of Akron (Court of Common Pleas)*, January 6, 1927. The zoning ordinance forbade the construction of the building in question in the locality in question, within 10 feet of the street or property line. Held that the setback provision was a reasonable exercise of the police power.

It is the province of the City Council to determine, in the first instance, whether the provision is reasonable and bears a substantial relation to the public health, safety, morals, or general welfare. Before the Court can declare the setback line unconstitutional, it must be shown that there is no such relation, and is therefore clearly arbitrary and unreasonable. The burden is upon the plaintiff.

No evidence was introduced on this point. The Court, however, has sufficient judicial knowledge to find that it cannot find it arbitrary, unreasonable, or unrelated to public health, safety and welfare. Thus the Court knows that motors in the street produce monoxide gas, which is more readily dispersed in the wider space between buildings than in a narrower one. In the wider space, there is also greater access of light, sun and air.

And the question must be viewed in the light of probable future developments.

NOTE BY EDITOR.—It is impossible, in the brief space available, to do justice to this admirable opinion. It is reprinted in the *Baltimore Daily Record* and should be read in full by students of city planning and zoning.

Recent Zoning Literature

The *Engineering News-Record* of December 30, 1926, contains an article on the "Relation of Zoning Ordinances to House Widths," by Arthur Richards, Planning Engineer, City Planning Commission, Altoona, Pa. The article analyzes the purposed zoning ordinance for Altoona, showing how it is based upon a formula which meets practical requirements. In illustration, the results of other ordinances are shown and the reasons for their defects discussed.

The Municipal Bond Market

By Sanders Shanks, Jr.

Editor, *The Bond Buyer*

MUNICIPALITIES have no cause for complaint over the condition of the bond market. In recent weeks an insistent demand for municipal securities, in fact for bonds of all classes, has carried prices up to the highest level reached since 1917. The largest cities can now borrow at a rate close to 4 per cent, while the smallest communities are asked to pay not more than 5 per cent.

The bond market is controlled by the factor of supply and demand. At this time the country is overflowing with surplus credit, and new wealth is being accumulated faster than its owners can invest it in stocks, bonds, real estate, expansion of industrial plants, building construction, etc. The result is seen in advancing prices for securities and reduced interest rates on mortgages, bonds, etc. In the municipal bond market, the factor of supply and demand is made even more favorable by reason of the fact that states and cities are making an effort to cut down their capital expenditures to the minimum, and this is reflected in a reduced output of new bond issues.

The following tabulation of some of the more interesting municipal bond issues sold in recent weeks will give the reader an idea of the type of loans being issued and the terms on which they have been sold:

Amount	Issue	Rate (%)	Term	Yield (%)
$ 85,000	Milton, Mass.	4	14 Yr. Avg.	3.84
100,000	Troy, N.Y...	4½	1-20 Yr. Ser.	4.05
10,800	Whitley Co., Ind.	4½	5 1/3 Yr. Avg.	4.12
678,000	Atlanta, Ga..	5	12 Yr. Avg.	4.14
175,000	Birmingham, Mich.	4¼	16 2/3 Yr. Avg.	4.24
1,995,000	Houston, Tex., Ind. Sch.Dis.	5	15-29 Yr. Ser.	4.50
223,000	Fairview, N.J.	5	5 5/6 Yr. Avg.	4.79
50,000	Douglas Co., S. Dak.....	4¼	12¼-20 Yr.Op.Avg.	4.62
49,000	Charl'st'n,S.C.	5	6 1/3 Yr. Avg.	4.68
35,000	Burton, Ohio.	5½	13 5/6 Yr. Avg.	4.84

President Coolidge Endorses the Community Chest Movement

The following statement by President Coolidge, endorsing the Community Chest plan as the best method yet devised for financing local benevolences, was received under date of October 27, 1926, by Allen T. Burns, Executive Director of the American Association for Community Organization:

THE WHITE HOUSE, WASHINGTON

I believe that the Community Chest plan of providing for local benevolences is the best which has been devised. By eliminating much of the cost of collection it increases the amount actually available for charitable purposes and makes for a wiser and more equitable division of funds in accordance with the needs and opportunities of each. The very fact that the American people stand ready at all times to aid a worthy cause tends in itself to increase the number of benevolences dependent for their existence upon annual contributions, so that there is a real danger that the fine objects of each may be obscured by the problem of maintenance and the true spirit of benevolence chilled by an endless succession of pressing demands. The Community Chest idea makes possible the inclusion of a definite sum for charitable contributions in the family budget and by a concentration of efforts focuses the thought of each community at one time on the duty and the privilege which is theirs to aid the deserving and to relieve suffering and misfortune.—CALVIN COOLIDGE.

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Highway Administration and Finance.—By Thomas R. Agg, Professor of Highway Engineering, Iowa State College, and John E. Brindley, Professor of Economics, Iowa State College, Ames, Iowa. McGraw-Hill Book Co., Inc. 1927. X + 382 pp. $4.00.

This volume, while devoting considerable space to national and state highway administration and the development of highway systems both within and outside the United States, contains several chapters of particular interest to municipal and county highway officials, especially those devoted to highway bonds, special assessments, municipal highway departments, contract and day labor construction, and civil service in the highway field.

Proposed Classification and Compensation Plans for Library Positions.—Report of the Bureau of Public Personnel Administration to the Committee on the Classification of Library Personnel of the American Library Association. Published by the Bureau of Public Administration, Mills Building, Washington, D. C. 1927. 208 pp. $2.15 postpaid.

The findings stated cover types of library organizations, qualifications of library workers, compensation, and special conditions of employment. The recommendations tend toward the bringing about of equitable and reasonable uniform compensation for the same kind of library work, and the securing and rewarding of loyal and efficient personal services.

Statistics of City Libraries, 1926.—7 pp. in *The Publishers' Weekly* for January 22, 1927. Tables, reprinted from the *Library Journal*, giving figures collected by Helen H. Martin, Sarah D. Davis, and Nina M. Keppel, students at the Albany Library School, Columbia University, and revised to September 1, 1926. The statistics include population, ordinary expenditures, expenditure per capita and per volume circulated, and total and per capita circulation in volumes. These are given for both 1926 and 1925. (Apply to *The Publishers' Weekly*, 62 West 45th Street, New York.)

Motor Vehicle Taxation and Regulation.—Three pamphlets issued in January, 1927, by the Motor Vehicle Conference Committee, representing the American Automobile Association, the National Automobile Chamber of Commerce, the Motor and Accessory Manufacturers' Association, the National Automobile Dealers' Association, and the Rubber Association of America: State Regulation of Motor Vehicle Common Carrier Business, 35 pp.; State Restrictions on Motor Vehicle Sizes, Weights and Speeds, 31 pp.; Special Taxation for Motor Vehicles, 31 quarto pp. (Apply to the Committee, 366 Madison Avenue, New York.)

Child Health Demonstration, Mansfield and Richland County, Ohio, 1922-1925.—Distributed by the American Child Health Association, 370 Seventh Avenue, New York. This demonstration was financed by the American Red Cross and supervised by a committee representing that organization, the American Child Health Association, the National Tuberculosis Association, the National Organization for Public Health Nursing, and the National Child Labor Committee. Important material in the field of public health, covering health education, with practical programs, medical and dental work, nursing, an account of the fresh air camp in Mansfield, nutrition work, and special activities of the Mansfield and Richland County Boards of Health. XXI + 354 pp. $1. (Apply to the American Child Health Association, 370 Seventh Avenue, New York.)

The City Manager Plan.—In the January, 1927, issue of *Toledo's Business* there is considerable material on the city manager plan of municipal government as viewed by leading citizens of other cities and as reported upon by a special committee of the Toledo Chamber of Commerce. The committee recommends: the adoption of the plan; the creation of a small City Council, composed of nine members elected at large; the selection by the Council of a City Manager of ability and experience, to serve at the will of the Council; the selection by the City Manager of all other department heads and officials, except the Council; and the use of the Hare system of proportional representation in elections. (Apply to the Toledo Chamber of Commerce, Toledo, Ohio.)

Official South African Municipal Year Book, 1926-1927.—Edited by W. P. M. Henderson, formerly Town Clerk of Durban; and Francis G. Pay. Published by Francis G. Pay, Adservice Building, 72 Loop Street, Capetown, South Africa (P. O. Box 1136). Selling Agents, J. C. Juta Co., Capetown and Johannesburg; Edw. G. Allen & Son, Ltd., 12 and 14 Grape Street, Shaftesbury Avenue, London, England. XXXII + 504 pp.

This volume gives comprehensive information and statistics on all the South African municipalities, including details of administration, public utilities, finance, fire protection, parks, etc., with interesting historical sketches. There are special sections on electric light and power, tramway undertakings, motor transport, engineering data—particulars of pipes of all descriptions used by South African municipalities, water-supply, fire protection, legal decisions affecting municipal corporations, and libraries.

The American Race Problem—A Study of the Negro.—By Edward Byron Reuter, Professor of Sociology in the University of Iowa. Crowell's Science Series, edited by Seba Eldridge, University of Kansas. Thomas Y. Crowell Company, New York. 1927. XII + 448 pp. $2.75.

Intelligent, fair discussion of the problem of adjustment between the white and Negro races should be based on reliable information. This Dr. Reuter has presented, showing the situation of the Negro at present and how it came to be as it is. Such a study involves looking at conditions from every possible angle—racial differences, racial contacts, racial prejudice and antipathy, the health of the Negro, his family life, his economic status, his progress in education and culture, his religious history and tendencies, his criminal record, lynchings, the growth of his race consciousness. The author maintains that race prejudice is a permanent reality that cannot be destroyed or overridden by militant programs, but that through intermixture the Negroes as such will ultimately disappear from the population. Till then, "there will be the problem of defining relations in terms tolerable to the members of each racial group."

Health Education.—*The Commonhealth* for October, November, December, 1926, published by the Massachusetts Department of Public Health. A collection of interesting and valuable articles by authorities on the teaching of health—its importance, and various methods; including a summary of the answers received from twenty cities to the following questions: What special health education projects are included in your program?; Have you a specialized personnel for these projects?; From what sources do you get your teaching material?; Does the Health Department have any share in your health education program? 37 pp. (Apply to George H. Bigelow, M. D. Commissioner, State Department of Public Health, Boston, Mass.)

Public Safety.—Volume One, Number One, of a publication under this title, issued by the National Safety Council in February, 1927. 4 large pp. Illustrated. This new monthly bulletin is published with the aim of bringing reliable, up-to-date information on public accidents and their prevention to every individual and every organization that desires such information and will use it. Additional information, to supplement the brief items presented in the bulletin, may be obtained on request. (Apply to the Council, 108 East Ohio Street, Chicago, Ill.)

Subways or Children.—Which or Both?.—A letter to the Board of Estimate and Apportionment from the City Club of New York. January 12, 1927. 32 pp. "If you will drop this 'independent' subway [the 53rd Street branch of the new subway, by tube from Eighth Avenue in Manhattan over to the East River, then under the river by tunnel, then up into Long Island City], left in your lap by the last administration, and give us instead, by parley and pact of all concerned, an enlarged dual subway system that is self-sustaining, you may do it for a 6-cent fare, or even less, with good service—and then you can give the children their parks and schools besides." (Apply to the Club, 55 West 44th Street, New York.)

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A Standard City Planning Enabling Act.—Prepared by the Advisory Committee on City Planning and Zoning of the U. S. Department of Commerce. Preliminary edition. February, 1927. This act covers the four general subjects which experience has shown to be a necessary part of planning legislation; the making of the city plan and the organization and powers of the city planning commission; the control of subdivisions; the control of buildings in mapped streets; regional planning and planning commissions. The text has been so arranged that parts can be omitted in the case of states that are not ready for the complete act. It is in all respects an enabling act, becoming effective only through the action of the people or their representatives in a municipality or region affected by it. 80 mimeographed pp. (Apply to Advisory Committee on City Planning, Department of Commerce, Washington, D. C.)

Extension Courses in Municipal Administration.—An announcement by the School of Citizenship and Public Affairs, Syracuse University, Syracuse, N. Y., 1927. The courses offered include: Municipal Finance and Taxation Administration; Municipal Budget Making; Administrative Control of Auditing, Reporting, and Cost Accounting; Centralized Purchasing; Appraisal and Assessment of Property for Taxation; Debt Administration; Municipal Corporations; Municipal Health Administration; City Planning and Zoning; Operation and Regulation of Municipal Utilities; Personnel Administration; Police Administration; Fire Administration; Public Reports and Graphic Statistics; Engineering and Public Works Administration. 8 pp. (Apply to the School.)

Industrial Survey of Springfield, Ill.—Compiled and prepared by A. R. Gwinn, Manager of the Industrial Development Department of the Central Illinois Public Service Company, Springfield, Ill. 48 quarto pp. in loose-leaf binder, with views, maps, diagrams, and tables, also a folding street map of Springfield. Reviewing and analyzing the industrial conditions and possibilities of the city and the territory immediately outside the city limits. The pages are thumb-indexed. (Apply to C. E. Jenks, Manager, Chamber of Commerce, Springfield, Ill.)

Suggestions for Complete School Health Examination Records.—The records were devised to meet the demands of physicians and dentists not accustomed to the examination of children in apparent health. 4 quarto pp. in *The Nation's Health* for January, 1927. "With increasing uniformity of procedure of well-tested, scientific worth, the part of the doctor in the school health program will gradually lose the reputation for ineffectiveness now so generally attached to it by educational authorities, other workers in the field, and by pediatricians in particular." (Apply to *The Nation's Health*, 22 East Ontario Street, Chicago, Ill.)

Rural Public Library Service.—A Handbook for Rural Leaders, printed for the League of Library Commissions, 1927, and distributed by the American Library Association Committee on Library Extension. 16 pp. Showing where information, advice, and help may be secured in establishing libraries or library service in country sections. Valuable information in a handy-size pamphlet. (Apply to the American Library Association, 86 East Randolph Street, Chicago, Ill.)

Community Trusts.—Pamphlets issued by The New York Community Trust, 129 Broadway, New York: The Story of the Community Trust (Number 10). The Origin and Objects of the Westchester Welfare Foundation, by V. Everit Macy, Chairman, The Westchester Advisory Committee of The Community Trust; To the Members of the Bar; and Forms (Number 11). These give a clear idea of the great need of "tackling the dead hand," and the way in which The Community Trust combines a business control over the investment of principal, with a social supervision over the expenditures of income. (Apply to Ralph Hayes, Director, The New York Community Trust.)

Relations Between Quality of Water and Industrial Development in the United States.—By W. D. Collins. December, 1926. 43 pp. Charts, tables. The industrial utility of water-supplies is analyzed in this study, showing the general character of water available at the centers of different kinds of industrial activity. The movement of centers of industrial activity is considered in connection with the quality of water available at old and at the new locations. 15 cents. (Apply to Government Printing Office, Washington, D. C.)

A Model Bond Law.—Submitted by the Committee on Municipal Borrowings of the National Municipal League; Carl H. Pforzheimer, Chairman. Supplement to the *National Municipal Review* for February, 1927. 20 pp. The introduction to the Model Bond Law presents a summary of its principal provisions. The law has been drafted with the idea of aiding state legislatures in promoting uniformity in legislation and consequent economy for the taxpayers. (Apply to the National Municipal League, 261 Broadway, New York.)

A Summary of Public Service Rendered by the Bureau of Municipal Affairs of Norwich University, 1921-1926.—The December 18, 1926, issue of the *Norwich University Record*. 24 pp. Illustrated. Under the heads of Information Requested, Bulletins Published, Local Reference Bureaus, Communities Addressed, and Government Conferences, the work of the Bureau is reported. An outstanding characteristic of this work has been the aid given to local officials and the establishment of local municipal reference bureaus. (Apply to the Bureau, Norwich University, Northfield, Vt.)

The Working of County Dance Hall Ordinances in Wisconsin.—By Francis H. Hiller, Field Secretary, National Probation Association. 11 pp. in the January, 1927, *Journal of Social Hygiene*. These observations of the working of the ordinances after two years of trial are taken from a study of probation in Wisconsin made under the auspices of the National Probation Association, the American Social Hygiene Association, the University of Wisconsin, and the State Board of Control of Wisconsin. Considerable improvement has been effected by the ordinances, but they are still inadequately enforced. Suggestions for improved administration are given. (Apply to the *Journal*, 370 Seventh Avenue, New York.)

Stadiums.—A pamphlet of 11 quarto pp. published by the Playground and Recreation Association of America, 315 Fourth Avenue, New York. Giving, in tabular form, facts about the various types of permanent athletic structures in the country, including date of construction, managing authority, seating capacity, size, shape, material of construction, method of securing funds, means of maintaining, and uses. The list embraces municipal, high school, private, Federal and county stadiums. (Apply to the Association.)

May Day; Child Health Day.—A Bulletin of Suggestions for 1927; 30 pp.; published by the American Child Health Association, 370 Seventh Avenue, New York; 10 cents. Also published by the Association—"May Day—National Child Health Day, 1926—A Summary of Nation-wide Organization, Cooperation, and Activities;" 36 pp. Also May Day Festival Book—1927; edited by Grace T. Hallock; 63 pp., illustrated; clever ideas for the celebration of the day, with definite programs. (Apply to the Association.)

Health and Physical Education in the Elementary Public Schools.—A report on two surveys made by chambers of commerce in cooperation with the Civic Department, Chamber of Commerce of the United States, Washington, D. C. December, 1926. Fifty-five cities took part in both surveys. "While it is important to know the general trends in this important subject, the greatest value of the report should come from the opportunity it offers to cities to measure their own progress, with the view of strengthening weak places, that greater progress may result from future efforts." 11 multigraphed pp. Tables. (Apply to the Department.)

Air Commerce Regulations Effective December 31, 1926.—Published by the Aeronautics Branch of the U. S. Department of Commerce. Handy size. 45 pp. (Apply to the Government Printing Office, Washington, D. C.)

Publications of the League of Minnesota Municipalities.—Four pamphlets. No. 11, The Abatement of Nuisances (including a suggested ordinance), by Harvey Walker; November 1, 1926; 8 pp.; 10 cents. No. 12, Garbage and Refuse Disposal for Small Municipalities (including two suggested ordinances), by J. A. Jensen and V. F. Curtis; November 1, 1926; 12 pp.; 15 cents. No. 13, Minnesota Water Rates; February, 1927; 30 pp. of data; $1. No. 14, Grading Municipalities to Determine Fire Insurance Rates, by Harvey Walker; January 15, 1927; 31 pp.; 50 cents. (Apply to League of Minnesota Municipalities, University of Minnesota Library, Minneapolis, Minn.)

Fairmount Park Association.—Fifty-fourth Annual Report, for 1926. 86 pp. Illustrated. One of this Association's attractive and distinctive reports. (Apply to the Association, 320 S. Broad Street, Philadelphia, Pa.)

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The Laurier Palace Theater Fire, Montreal, January 9, 1927.—A bulletin prepared by the National Fire Protection Association, 40 Central Street, Boston, Mass., presenting, with black borders, a scathing condemnation of those responsible either directly or indirectly for the use of a theater of inferior construction with improper exits and for a disregard of the requirements of the Montreal ordinances. 4 quarto pp., with plans of the theater and views of the results of the fire, which caused the death of 78 persons and injured 30. The defects of the theater are contrasted with safe building practice and attention is called to the Buildings Exits Code and Suggested Ordinance for Theaters of the National Fire Protection Association. (Apply to the Association.)

Health Bulletin of the Insurance Department, Chamber of Commerce of the United States.—Number One of this bulletin, released February 17, 1927. 6 quarto pp. Containing material helpful for health committees, on prolonging life by cooperative effort, with reports from various places showing how health committees of chambers of commerce have cooperated with public health authorities to prevent sickness and premature death in their respective communities. (Apply to the Insurance Department of Commerce of the United States, Washington, D. C.)

Manual of the City Commission and of the Municipal Government of the City of Grand Rapids, Michigan.—Centennial Edition to Commemorate One Hundredth Anniversary of Arrival of Louis Campau, First Settler. Published by order of the City Commission. Pocket size. 200 pp. Illustrated. Containing an interesting historical sketch of the city and full information as to the duties of the city officials and departments, and as to the various administrative details; also the charter of the city, in full. (Apply to J. C. Shinkman, City Clerk.)

City Planning in Indiana.—By G. E. Lommel, Associate Professor of Topographical Engineering, and Secretary-Treasurer, Indiana City Planning Association. The material recorded in this report was taken from progress reports presented at the Fourth Annual Conference on City Planning held under the joint direction of the Engineering Extension Department, Purdue University, and the Indiana City Planning Association, at Terre Haute, Ind., September 28-30, 1926. 15 mimeographed pp. Showing the results of the Indiana State City Planning Enabling Act passed in 1921; 22 cities have formed planning commissions, and all but two of these have made progress in the development of comprehensive plans. (Apply to Engineering Extension Department, Purdue University, Lafayette, Ind.)

Government Research, Past, Present and Future.—By Charles A. Beard. This is the first publication of the new Municipal Administration Service, of the National Municipal League, 261 Broadway, New York. An address commemorating the twentieth anniversary of the beginning of municipal research, delivered in Rochester, N. Y., November 23, 1926, at the annual meeting of the Governmental Research Conference. 8 pp. (Apply to the League.)

Tax Rate Book for 1926, Kansas.—A compilation of the city, the city school, and the county tax rates effective for 558 cities and 105 counties in Kansas, together with the populations, assessed valuations, and bonded indebtedness. 42 pp. in the January, 1927, issue of *Kansas Municipalities*, the Annual Number, containing the Proceedings of the 1926 meeting of the League of Kansas Municipalities. $1. (Apply to the League, Lawrence, Kans.)

Why Cities Should Not Give Up Their Light and Power Plants.—The January, 1927, issue of *Public Ownership*, published by the Public Ownership League of America, 127 North Dearborn Street, Chicago, Ill. The material on "Don't Give Up Your Power Plant" is prepared by Carl D. Thompson, Secretary of the League, and sets forth fourteen reasons why "whatever the problems of your municipal light and power plant, they can be solved, the plant be made a success and a money maker." 16 pp. (Apply to the League.)

Third International Congress of Cities.—Report of this Congress, held in Paris September 28-October 4, 1925, organized by the International Union of Cities and Communes, and by the Union of Cities and Communes of France, with the patronage of the French Government and under the auspices of the city of Paris and the Department of the Seine. Parts I and II (38 and 103 quarto pp., illustrated) contain the general papers and reports on the organization and activities of the various unions and local authorities. Part III (over 300 pp.) contains reports on municipal government in various countries. Parts IV to VI (116, and 139, and 68 pp.) contain material on the land policy of the communes and its influence on the housing problem; the judicial and administrative problems that result from city annexation; and the resolutions and conclusions of the Congress. The reports and papers given in French, German, or English. (Apply to the Union Internationale des Villes, 3bis, Rue de la Regence, Brussels, Belgium.)

Platting Regulations, Altoona, Pa.—Rules Relating to the Subdivision of Land, adopted October 26, 1926 by the City Planning Commission of Altoona. The section of the Laws of the General Assembly of Pennsylvania creating city planning departments in cities of the third class is quoted, and the method of procedure of Altoona's City Planning Commission is given complete. 15 pp. Handy size. (Apply to the Commission.)

The Fort Myers Plan.—Report of the Planning Board of Fort Myers, Fla., prepared by Herbert S. Swan, city planner, of New York, and his associate city planners, George W. Tuttle, engineer, and Erwin T. Muller. An elaborate illustrated report of 95 quarto pp., with large folding map. After a description of Fort Myers as to location, natural advantages and facilities, and its history, the plan is presented under the heads of traffic, thoroughfares, street planting and maintenance, parks and parkways, schools, railroads, public buildings, housing and zoning, with a special study of the Caloosahatchee River, on which the city is situated. (Apply to Herbert S. Swan, 15 Park Row, New York.)

The Commonwealth Fund.—Eighth Annual Report, for the year 1925-1926. The Commonwealth Fund was founded by Mrs. Stephen V. Harkness for "the welfare of mankind." The work reported upon includes child health and child guidance in the prevention of delinqency, education, and educational and legal research, rural hospitals, health work in Austria, and various special grants in the fields of mental hygiene and child guidance. 82 pp. Interesting illustrations. (Apply to the Fund, 1 East 57th Street, New York.)

Commerce on the Milwaukee River.—A report to the Mayor and Common Council of Milwaukee by the Board of Harbor Commissioners, accompanied by the report of a survey made by J. A. B. Tompkins, C. E., and J. A. B. Tompkins, Jr., C. E. 1926. 87 pp., with 3 folding diagrams. The study was undertaken to determine the relative importance of land and river traffic, present and prospective, in order to adjust bridge and river maintenance and to regulate general urban traffic in Milwaukee. William George Bruce is President of the Board of Harbor Commissioners. (Apply to Ernest Bruncken, Secretary of the Board.)

Real Estate Owned by the City of Detroit.—A report prepared by the Detroit Bureau of Governmental Research, Inc., for the Mayor. January, 1927. Report No. 53 of the Bureau. 58 mimeographed pp. This complete record of the real estate holdings of the city departments, boards, and commissions has been made in accordance with a city ordinance passed in 1920. An analysis of the situation is given, and recommendations as to the appraisal, disposal, and recording of these properties. (Apply to the Bureau.)

National Conference on Weights and Measures, 1926.—Report of the Conference held at the Bureau of Standards, Washington D. C., May 25-28, 1926. Papers and discussion. 172 pp. with folding view of delegates, and other illustrations. Miscellaneous Publications of the Bureau, No. 74. 60 cents. (Apply to Government Printing Office, Washington, D. C.)

A Model State Constitution.—Prepared by the Committee on State Government of the National Municipal League. Revised edition, with explanatory articles. 43 pp. The articles in explanation and defense of the model state constitution include: The Legislature, by H. W. Dodds; The Executive, by John A. Fairlie; The Budget, by A. E. Buck; The Judiciary, by W. F. Dodd; Counties, by Richard S. Childs. (Apply to the National Municipal League, 261 Broadway, New York.)

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Fifty Years of Progress in Bridge Engineering: From the Brooklyn Bridge to the Liberty Bridge.—By Dr. D. B. Steinman, consulting bridge engineer. A paper presented October 28, 1926, before the Brooklyn Engineers' Club, and published in the Proceedings of the Club. Volume XXV, Part I, October, 1926. 14 pp. Illustrated. The outstanding elements of improvement in bridge design and construction are briefly described and a review of progress in the different types of steel bridge construction is given. There is special mention of the proposed Liberty Bridge, to span the Narrows in New York Harbor, between Fort Hamilton, Brooklyn, and Fort Wadsworth, Staten Island. (Apply to the Club, 117 Remsen Street, Brooklyn, N. Y.)

DAYTON, OHIO.—Annual Report, Division of Health, Department of Public Welfare, 1926.

LOS ANGELES, CALIF.—Annual Report, Department of Playground and Recreation, year ending June 30, 1926.

MICHIGAN.—Biennial Report, State Tax Department, 1925-1926.

NEW YORK CITY.—Annual Reports, Art Commission, 1924 and 1925.

PASADENA, CALIF.—Annual Report, Health Department, year ended June 30, 1926.

WEST VANCOUVER, B. C.—Financial Statement of the Corporation of the District, 1926.

Conventions—When and Where

MARCH 2-4.—OTTAWA, CANADA.
Canadian Section of American Water Works Association. Annual meeting. Secretary, A. U. Sanderson, Island Filtration Plant, Toronto, Ont.

MARCH 16-18.—BOSTON, MASS.
Public Service Institute, under joint auspices of Massachusetts Institute of Technology and Massachusetts Civic League. Address: James P. Munroe, Chairman, Executive Committee, Public Service Institute, 79 Summer Street, Boston, Mass.

APRIL 1-2.—FORT PIERCE, FLA.
Florida Commercial Secretaries' Association. Annual meeting. Secretary-Treasurer, A. A. Coult, Fort Myers, Fla.

APRIL 7.—ROCKY MOUNT, N. C.
Eastern Carolina Chamber of Commerce. Anual meeting. Secretary, N. G. Bartlett, Kinston, N. C.

APRIL 11.—NEW YORK CITY.
National Committee on Prisons and Prison Labor. Annual meeting. Secretary, Miss Julia K. Jaffray, 4 West 57th Street, New York.

APRIL 13-16.—DES MOINES, IOWA.
American Physical Education Association. Annual convention. Secretary, Dr. J. H. McCurdy, Box G, Highland Station, Springfield, Mass.

APRIL 22-23.—PHILADELPHIA, PA.
American Academy of Political and Social Science. Annual meeting. Secretary, J. P. Lichtenberger, P. O. Box 4060, West Philadelphia, P. O., Philadelphia, Pa.

APRIL 25-27.—CHATTANOOGA, TENN.
Southern Commercial Secretaries Association. Annual convention. Secretary, B. S. Barker, Atlanta, Ga.

APRIL 26-28.—JACKSON, MISS.
Southeastern Water and Light Association. Annual convention. Secretary, W. F. Stieglitz, Columbia, S. C.

APRIL 28-30.—CLEVELAND, OHIO.
Progressive Education Association. Annual conference. Secretary, E. Morton Synder, 10 Jackson Place, Washington, D. C.

MAY 3-5.—WASHINGTON, D. C.
Chamber of Commerce of the United States of America. Annual meeting. Secretary, D. A. Skinner, 1615 H Street N. W., Washington, D. C.

MAY 9-11.—WASHINGTON, D. C.
American Child Health Association. Annual meeting. Secretary, Dr. Philip Van Ingen, 370 Seventh Avenue, New York.

MAY 9-11.—DES MOINES, IOWA.
International Association of Policewomen. Annual convention. President, Mrs. Mina C. Van Winkle, Washington, D. C.

MAY 9-11.—WASHINGTON, D. C.
National Conference on City Planning. Annual conference. Secretary, Flavel Shurtleff, 130 East 22nd Street, New York.

MAY 9-12.—CHICAGO, ILL.
National Fire Protection Association. Annual meeting. Secretary, Franklin H. Wentworth, 40 Central Street, Boston, Mass.

MAY 9-12.—DES MOINES, IOWA.
National Probation Association. Annual convention. General Secretary, Charles L. Chute, 370 Seventh Avenue, New York.

MAY 9-12.—CINCINNATI, OHIO.
Natural Gas Association of America. Annual convention. Secretary, Guy F. Bachelor, Oliver Building, Pittsburgh, Pa.

MAY 11-13.—WASHINGTON, D. C.
American Institute of Architects. Annual convention. Executive Secretary, E. C. Kemper, The Octagon, Washington, D. C.

MAY 12-13.—SAN ANGELO, TEXAS.
League of Texas Municipalities. Annual convention. Executive Secretary, Harvey W. Draper, 815 Capitol Avenue, Houston, Texas.

MAY 13-19.—DES MOINES, IOWA.
American Association for Community Organization. Annual meeting. Executive Director, Dr. Allen T. Burns, 215 Fourth Avenue, New York.

MAY 12-19.—DES MOINES, IOWA.
National Conference of Social Work. Annual conference. Secretary, Howard R. Knight, 277 East Long Street, Columbus, Ohio.

MAY 16.—DES MOINES, IOWA.
American Association of Social Workers. Annual meeting. Executive Secretary, Philip Klein, 130 East 22nd Street, New York.

MAY 17-18.—CHICAGO, ILL.
National Firemen's Association. Annual convention. Secretary, Captain J. E. Mersch, 715 Monroe Street, Evanston, Ill.

MAY 18-20.—BOSTON, MASS.
American Federation of Arts. Annual convention. Secretary, Miss Leila Mechlin, 1741 New York Avenue, Washington, D. C.

MAY 23-25.—WASHINGTON, D. C.
American Association of Museums. Annual meeting. Executive Secretary, Lawrence Vail Coleman, Smithsonian Institution, Washington, D. C.

MAY 24-25—INDIANAPOLIS, IND.
Indiana Association of Chiefs of Police. Annual meeting. Secretary-Treasurer, A. G. Ebersole, Superintendent of Police, Lafayette, Ind.

MAY 26-28.—VANCOUVER, B. C.
Town Planning Institute of Canada. Annual meeting. Secretary, John M. Kitchen, City Hall, Ottawa, Canada.

JUNE 4.—GRAND RAPIDS, MICH.
General Federation of Women's Clubs. Biennial Council Meeting. Address general headquarters: 1734 N Street N. W., Washington, D. C.

JUNE 6-10.—ATLANTIC CITY, N. J.
National Electric Light Association. Annual convention and exhibition. Secretary, A. Jackson Marshall, 29 West 39th Street, New York.

JUNE 6-11.—CHICAGO, ILL.
American Water Works Association. Annual convention. Secretary, Beekman C. Little, 170 Broadway, New York.

JUNE 13.—TORONTO, CANADA.
Canadian Public Health Association. Annual meeting. General Secretary, J. T. Phair, Spadina House, Toronto, Ont.

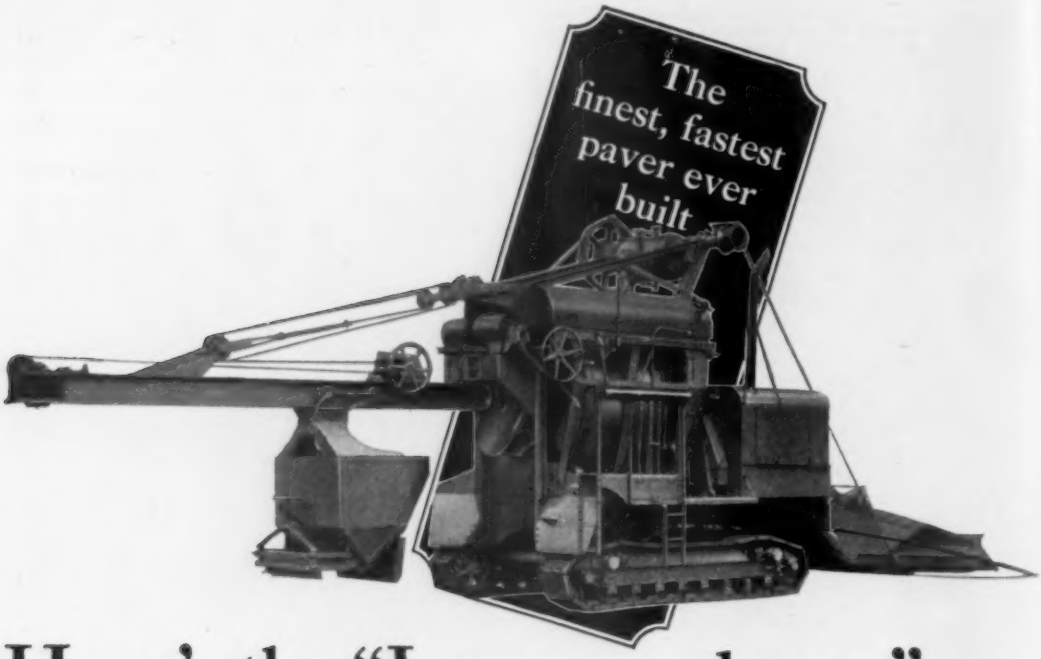
WEEK OF JUNE 20.—PARIS, FRANCE.
International Congress of Administrative Sciences. Third meeting. Address: Professor Leonard D. White, University of Chicago, Chicago, Ill.

JUNE 20-24.—DETROIT, MICH.
American Institute of Electrical Engineers. Summer convention. Secretary, F. L. Hutchinson, 33 West 39th Street, New York.

JUNE 23-25.—FORT WORTH, TEXAS.
Chiefs of Police and City Marshals Association of Texas. Annual convention. Secretary, George A. Smith, P. O. Box 299, Dallas, Texas.

JUNE 27-JULY 2.—STOCKHOLM, SWEDEN.
International Chamber of Commerce. Fourth general meeting. Secretary, American Section, Lacey C. Zapf, 1615 H Street, Washington, D. C.

AUGUST 16-19.—SALT LAKE CITY, UTAH.
International Association of Municipal Electricians. Annual convention. Secretary, Erwin H. Benz, Municipal Building, West New York, N. J.; Chairman of Exhibit Committee, Daniel J. Morgan, Sales Engineer, Hazard Manufacturing Company, Wilkes-Barre, Pa.



Here's the "Low- down" on Paving Mixers

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At the Road Show one or more Pavers had these features in common with Rex

Timken bearings—Power-operated discharge—Three-point suspension—Automotive clutches—24" drum openings—High-pressure lubrication—Heat-treated discharge chute.

***But Only the Rex had all those features* plus these:**

Fully enclosed speed reduction running in oil, mounted with the engine as one single complete unit.

Completely enclosed driving transmission, running in oil.

Heat-treated mixing blades and mixing buckets.

7-second water—accurate to the pound.

Automatic governor booster—speeding up engine and drum during charging and discharging.

Flexible Chabelco Chain drive on drum.

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Six-cylinder engine—or choice of four.

8-second discharge.

Fool-proof, power-operated discharge—completely enclosed—running in oil.

Unified action—with charging and discharging times perfectly overlapped.

Spiral, lime-proof cooling system that keeps the engine cool and eliminates radiator and fan.

Foldback top—easily and quickly raised or lowered—by power.

Countershaft above the dirt line.

Dropped-forged gears.

More alloy steel than any paver.

* * *

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CHAIN BELT COMPANY, 767 Park Street, Milwaukee, Wisconsin

REX PAVERS

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News and Illustrations

Items of Interest to City, Town and County Officials, and Others Concerned with the Economical Construction and Efficient Operation of Public Improvement Undertakings

The Evolution of Edging for Two-Course Paving

We are indebted to the W. S. Godwin Company, Inc., Baltimore, Md., for the illustrations and information given below referring particularly to the type of protection for the edges of two-course pavement and the comparison of initial costs.

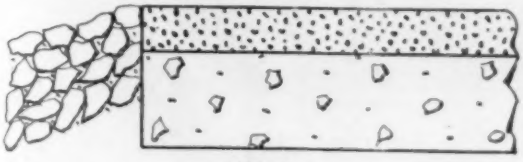


FIG. 1

The first illustration shows asphaltic macadam placed beyond the edges of the road. This material lacked the inherent stability of the road surfacing and hence gave very little, if any, protection. The cost of placing a 6-inch strip of asphaltic macadam 18 inches wide to protect the surfacing adds 0.1665 cents per square yard at $2 or 33 cents per lineal foot.

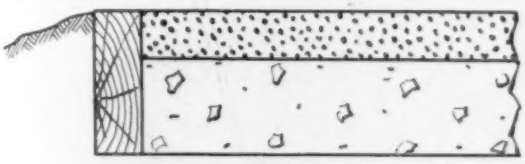


FIG. 2

The second illustration shows the use of wooden planks to hold the edge of the surfacing. Weather warps and loosens such planks, and traffic quickly breaks them away from the paving, so that as a side support they serve but a very short time. The cost of placing 3 x 9-inch planks along the edge to hold the surface paving in place adds 13 cents per lineal foot to the cost of the paving.

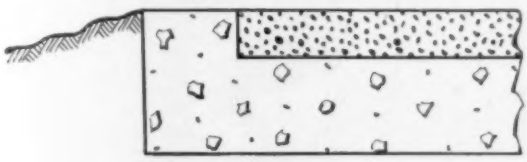


FIG. 3

The third illustration shows the concrete base made higher at the edge to protect the surfacing material. This does not prove satisfactory, because the mixtures used in bases are not intended for, and do not stand up under, the impact and wear of traffic. The cost of building up the 1:2:4 concrete base to form an integral edging 3 inches deep and 6 inches wide adds 0.0046 cubic yards of concrete at $15, or 7 cents per lineal foot, to the cost of the pavement.

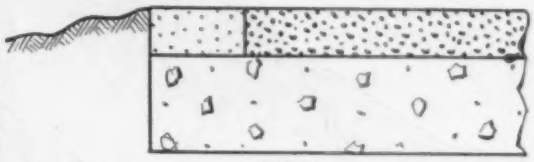


FIG. 4

The fourth illustration shows a separate concrete edging laid on top of the base even with the road surface. Because of the different mixtures, base material, and a richer edging, it was difficult to secure a satisfactory bond between them. The upper strip was broken away by the traffic and by the difference in expansion of the two mixtures. Placing a separate 1:2 concrete edging 3 inches deep and 6 inches wide on the concrete base requires 0.0046 cubic yards of concrete at $30, or 14 cents added to the cost of the pavement per lineal foot.

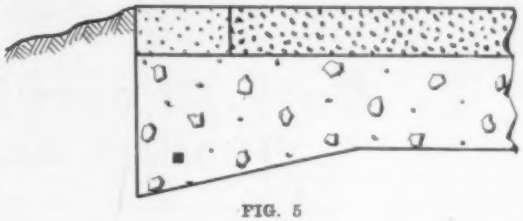


FIG. 5

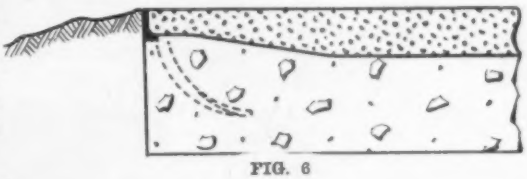
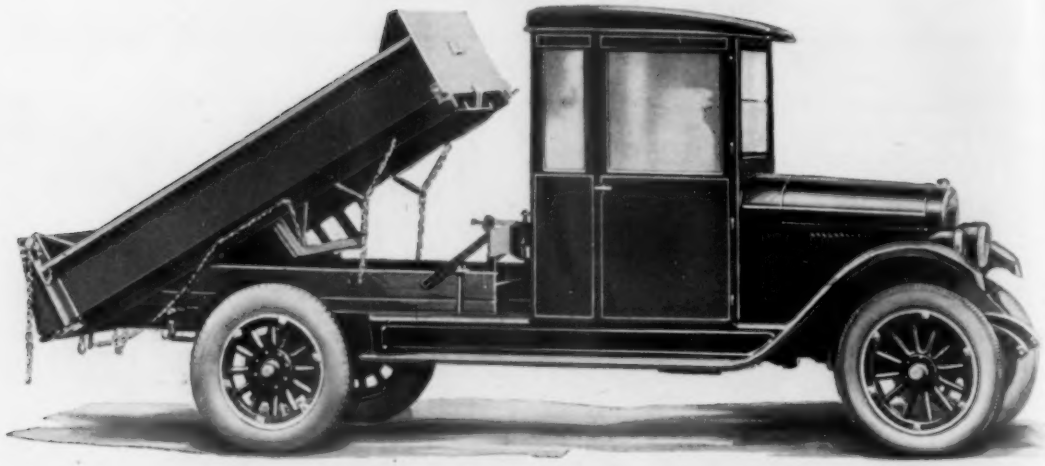


FIG. 6

The fifth method of protecting the pavement was by thickening the edge of the base at the bottom with additional concrete and reinforcing steel. This necessitated extra grading, more concrete and steel. The rest of the construction remains the same as in the paragraph immediately above. The cost of placing a separate 1:2 concrete edging 3 inches deep and 6 inches wide on the concrete base as described in the paragraph above is 14 cents. The cost of thickening the edge of the base at the bottom with a 3 x 24-inch rectangular strip of concrete to give the edge equal strength to the interior portion, adds 0.0093 cubic yards of concrete at $15, or 14 cents. To this must be added an equal amount of grading to the triangular strip at $1.50 per cubic yard, or 1½ cents. The cost of

for Economical Transportation

CHEVROLET



Only Chevrolet offers such Quality and Economy

At these sensationally low prices, Chevrolet offers prospective truck buyers the advantages of numerous quality features! Among these are: the flexibility and handling ease of a three-speed gearshift transmission —the power and smoothness of Chevrolet's valve-in-head motor—the durability and efficiency of Chevrolet's rugged rear axle, and springs set parallel to the load. And a host of mechanical advancements—including AC oil filter, AC air cleaner, new positive oil pump and new improved dry-disc clutch—all combine to assure even lower operating and maintenance costs. Truly, no other truck so low in price so successfully meets the public demand for quality and economy as do the Chevrolet trucks of today!

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1-Ton Truck Chassis $495

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CHEVROLET MOTOR COMPANY
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World's Largest Builder of Gear-shift Trucks

placing the usual ¾-inch deformed reinforcing rod in the triangular strip adds 1½ pounds at 5 cents per pound, or 7½ cents, making the total for this method of protection 37 cents per lineal foot.

The sixth method of protecting the edge is through the use of Godwin steel paving guards with the surfacing paving extended to the edge. In this manner the traffic impact is absorbed and distributed. Continuous steel beams and thickened concrete give equal bearing strength with the interior paving. The rigid side support for the surfacing is an integral part of the base, and the cost of the steel paving guard installed is 20 cents per lineal foot, and the cost of the additional asphalt paving 3 inches deep x 6 inches wide to replace the concrete edging in the last three illustrations above equals 0.0555 square yards at $1.50, or 8 cents, making the cost of the last a total of 28 cents.

In comparing these figures, it will be seen that the first four designs provide an edging only, while the last two provide both edging and additional bearing strength. To obtain a true comparison, then, between the cost of paving-guard construction and any one of the first four methods, it is necessary to add the cost of the last three items in the fifth method, or 23 cents, to the cost in the first four items, as this is the extra cost of the necessary bearing strength.

A New Model Portable Asphalt Repair Plant

A complete portable asphalt repair plant that is readily transportable and capable of economically producing material for street repairing with mixtures equivalent to those delivered from large stationary plants, has been announced by the Chausse Oil Burner Company, West Beardsley Avenue, Elkhart, Ind. This plant produces and permits the laying of genuine hot asphalt and can handle either the entire patching of medium-size and small cities, or localized patching work for large cities or for supplementing stationary plants or for winter patching when large plants cannot be run economically. They are also effective units for contractors handling small asphalt paving jobs in private work.

The new Model E-3 Chausse plant is a mechanically operated machine with rotary sand drier, pugmill mixer, oil burners, and measuring devices, all of which are found in stationary plants. In addition, it is self-propelled on rubber-tired wheels and contains storage bins for materials, making the machine an independent unit for use directly where the work is being done.

The machine will keep five men busy raking and laying, according to the manufacturers, who also state that its operating cost is far lower than that of any other means of mixing asphalt in small quantities, requiring only two men, four gallons of kerosene per hour, and ten gallons of gasoline per day. The Model E-3 plant is equipped with a Continental Red Seal four-cylinder engine which drives the rotary sand drier, pugmill mixer, and which furnishes propulsion through a hardened-roller, heavy-duty chain, temper rim sprockets, and individual clutches.

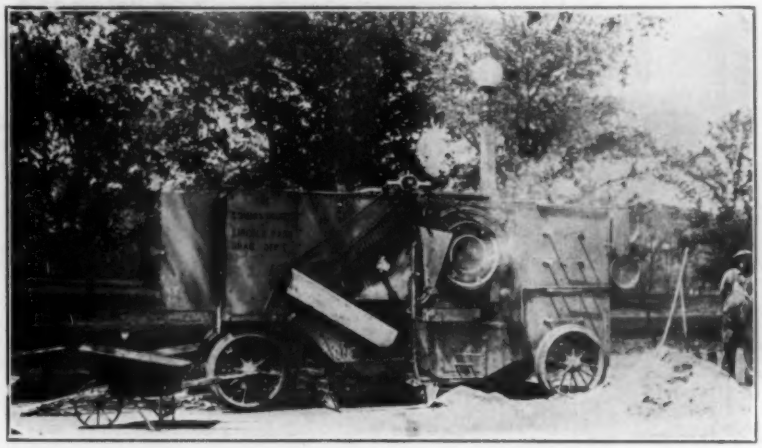
The plant is rated at 150 square yards of 2-inch compacted mix per 8-hour day, but it can operate economically on a smaller output or produce a considerably increased amount without harm to the mechanism. It is stated that the machine will produce a 450-pound batch, sufficient to cover 2⅓ square yards of 2-inch compacted asphalt, every five or six minutes.

Reclaiming old asphalt during the operation of the machine is a valuable feature, if desired. The material can be cut from the street, loaded into the sand drier, heated to 350 degrees, agitated in the mixer, new asphalt added, and returned to the street, thus providing a marked economy in patching costs. A tool heater with oil burner is located at the rear of the machine for heating rakes, tampers, shovels, and smoothing irons.

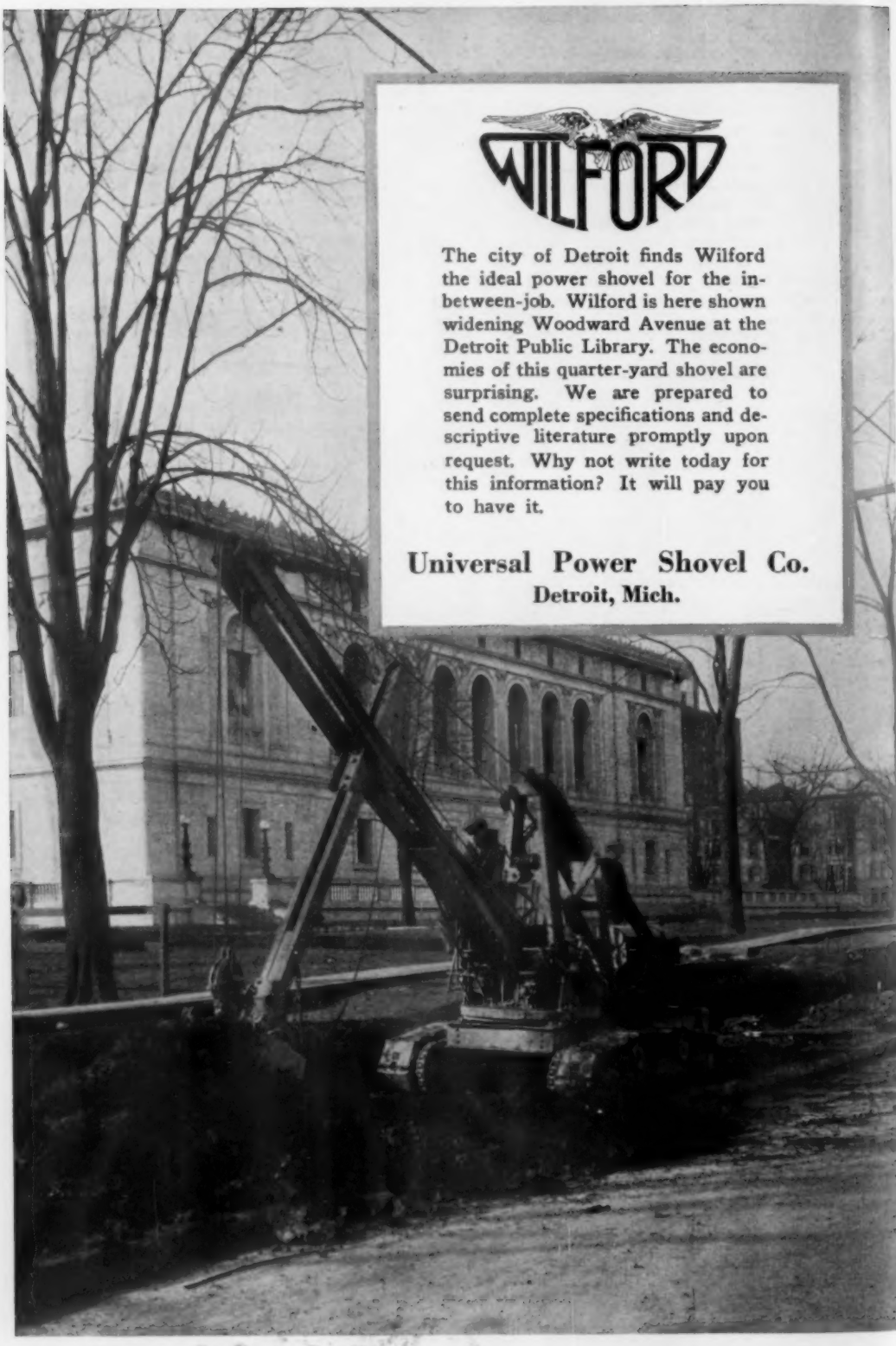
In the machine are bin storage for 135 gallons of asphalt, 2¼ yards of mineral aggregate, 18 bags, or 1,750 pounds, of lime dust or cement, and tanks to hold 60 gallons of kerosene and 9 gallons of gasoline. The weight of the machine with tanks and bins empty is 9,400 pounds.

Oil Jack Company Moves Offices

The Oil Jack Company, Inc., manufacturers of the Pedersen Oiljak, have announced the removal of their general offices to 15 Park Row, New York City. This company is now in full production on two models of the Oiljak, the JB-3 up to 3 tons and the JB-10 up to 10 tons. These jacks are applicable for use with automobiles, busses and trucks, by builders and contractors, water-works, highway and fire departments, and for many other services.



CHAUSSE COMPLETE PORTABLE ASPHALT PLANT IN USE BY THE COMMISSIONERS OF LINCOLN PARK, CHICAGO


WILFORD
The city of Detroit finds Wilford the ideal power shovel for the in-between-job. Wilford is here shown widening Woodward Avenue at the Detroit Public Library. The economies of this quarter-yard shovel are surprising. We are prepared to send complete specifications and descriptive literature promptly upon request. Why not write today for this information? It will pay you to have it.
Universal Power Shovel Co.
Detroit, Mich.

THE NEW N. T. A. TRAFFIC BUTTON WITH MONEL METAL HEAD

A New Type of Traffic Marker

Malleable iron markers with nickel alloy covering have been placed on the market by the National Traffic Appliance Corporation, 510 North Dearborn Street, Chicago, Ill., as a permanent and economical method of controlling traffic on city streets. These markers are brilliant and attract the attention of motor vehicle operators. The manufacturers state that the markers are unbreakable and nonrusting, so that they always appear lustrous in traffic. The head fits snugly to the pavement and is so smooth that it does not offer any obstruction to traffic.

An analysis of maintenance costs of painted lines for the control of traffic indicates that repainting is necessary on an average of seventeen times per year at a cost of 3 cents per foot for each painting, or 51 cents per foot per year. N.T.A. traffic markers cost about 45 cents each when installed and when placed on 12-inch centers cost only 45 cents per foot over a period of years. The city of Chicago is using these markers in all types of pavement in which it formerly used paint and is finding them satisfactory.

A New Type of Parkway Cable

There are times when a lighter type of parkway cable is desirable in city lighting service without sacrificing to any considerable extent the inherent qualities of the standard double-steeltaped cable. Loxsteel cable, made by the Hazard Manufacturing Company, Wilkes-Barre, Pa., is armored with a single shaped steel strip wrapped on the cable spirally and so formed as to interlock the steel strip, giving a continuous protective steel sheet without any openings. The strength of the Loxsteel covering compares favorably with that of the regular double flat steel covering as shown by the test noted below. Regular cable showed its first noticeable flattening when pressure was applied on a ¾-inch steel rod perpendicular to the cable at 550 pounds, while Loxsteel cable showed its first noticeable flattening at 420 pounds. The reduction in diameter of the lead sheath of regular cable when a load of 2,000 pounds was applied on a ¾-inch rod was 0.100 inches, while with the Loxsteel cable, it was 0.143 inches. With a ⅞-inch chisel bearing on the cable at right angles to the cable, both the regular cable and the Loxsteel cable were slightly indented at 250 pounds pressure, both indented at 500 pounds pressure, and deeply indented at 750 pounds pressure. The Loxsteel cable was cut very nearly through at 1,000 pounds pressure, while regular cable was very deeply indented, and at 1,250 pounds pressure the Loxsteel cable was cut through and the regular cable was almost cut through. With a 7,500-pound load applied on a flat bar with the flat surface bearing on the cable, the reduction in diameter of the lead sheath of the regular code was 0.085 inches, while the reduction on the Loxsteel cable was only 0.085 inches.

Loxsteel cable is somewhat lighter than the standard type of parkway cable, thereby effecting a saving in freight charges and making it a little easier to handle.

SECTION OF LOXSTEEL PARKWAY CABLE

Protecting Trees from Climbing Insects

It is necessary to protect shade trees on city streets from such pests as climbing cutworms, hanker-worms, tussock moth caterpillars, gypsy and browntail caterpillars and ants.

As a harmless method of protecting the trees from these pests, the O. & W. Thum Company, Grand Rapids, Mich., has developed Tree Tanglefoot, a sticky substance which is applied in bands two or three inches wide around the tree trunks. It is applied easily with a wooden paddle and stays sticky on the trees from three to four months. One pound of this material makes twelve to fifteen lineal feet of bands. No mixing is required, and the material stays soft and elastic, expanding with the growth of the tree.

It is recommended that Tree Tanglefoot be applied to trees for gypsy and browntail moths as soon as the snow is off the ground; for tussock moths before May 15; for spring canker-worms in the South about January 1, in the North about March 1; for fall canker-worms in the South not later than September 1, in the North not later than October 15; and for climbing cutworms not later than May 1.

Worthington Buys Harris Air Pump Company

The Worthington Pump and Machinery Corporation, 115 Broadway, New York, has announced the purchase of the Harris Air Pump Company, of Indianapolis, Ind., for some years one of the foremost manufacturers of air-lift systems and air-lift pumps. The purchase was made outright and includes patents, drawings, patterns, and good-will.

Fox Rotary Snow Broom Company Moves Offices to New York City

W. G. Fox, Fox Rotary Snow Broom Company, has announced the removal of the company's offices to Room 1809, 2 Lafayette Street, New York City.

Audubon, N. J., suburb of Philadelphia and Camden

Concrete Streets in Audubon, N. J.

CONCRETE pavement invites the motorist, the eye, and the consideration of city planners and builders who would achieve permanent streets at reasonable first cost and minimum maintenance.

Audubon and its vicinity typify the modernity and attractiveness that concrete streets give to the average community. Audubon laid its first concrete street six years ago. Today it uses no other material for street improvement.

This aerial view gives an impression of the extensiveness of Audubon's concrete street area. What it cannot give is a realization of the increased safety to motorists and definite enhancement of property values, which result from the use of this modern, enduring pavement.

PORTLAND CEMENT ASSOCIATION

33 W. Grand Avenue, CHICAGO, ILL.

CONCRETE *for permanence*

When writing to Advertisers please mention THE AMERICAN CITY—Thank you.

Methods of Mounting Street and Regulation Signs

The logical method of mounting a street or traffic sign is to put it on a steel post about 10 feet long, set 24 to 30 inches in concrete. According to the Standard Manufacturing Company, Cedar Falls, Iowa, manufacturers of Aluminite street markers and traffic signs, the following methods may also be used for mounting signs when the steel post is not available. The first illustration shows a stop sign attached to a wood telephone pole. The brackets are made of aluminum and the rods which encircle the post are made of brass. Any sign of this style can be used with this mounting.

TELEPHONE POLE MOUNTING FOR BOULEVARD STOP SIGN

ELECTROLIER MOUNTING FOR PARKING SIGN

ALUMINUM BRACKET MOUNTING FOR FOUR-WAY STREET SIGN

The second illustration shows a parking regulation sign mounted on an electrolier by means of an aluminum bracket. Any Aluminite stop sign or parking sign can be used with this mounting. The brackets and bands should be chosen to fit different sized electroliers.

The third illustration shows a standard four-way Aluminite marker with an aluminum bracket mounting for use on an electrolier. This method of mounting the street sign is sturdy, substantial, and neat in appearance.

Valve Company Celebrates Fiftieth Anniversary

The Kennedy Valve Manufacturing Company, Elmira, N. Y., was founded in 1877 by Daniel Kennedy, who is still President and in active charge of the organization. This year marks the fiftieth anniversary of the Kennedy Valve Manufacturing Company. This unusually long and uninterrupted continuity of ownership and management has been an important factor in the steady development and sound growth of the Kennedy business to its present prominence.

After successively outgrowing the four-story building in New York City in which it was started and a much larger plant at Coxsackie, N. Y., the company moved in 1907 to Elmira, N. Y., where it now occupies two large plants, covering a total of 35 acres.

Development of the Kennedy Valve Manufacturing Company has from its beginning been closely identified with engineering progress in the various fields which it has served. It was one of the first to recognize the advantages of gate-valve design, and its educational efforts and many successful installations played a large part in winning general acceptance of this type of valve in the service for which it is adapted. The company is proud of the fact that in its entire history not one of its designs has ever had to be recalled. Today the Kennedy line covers a large range of valves for standard and special requirements as well as pipe fittings and fire-hydrants. Kennedy products are in wide use in central power-stations, water-works, fire protection systems, industrial plants, hotels and office buildings throughout the country.

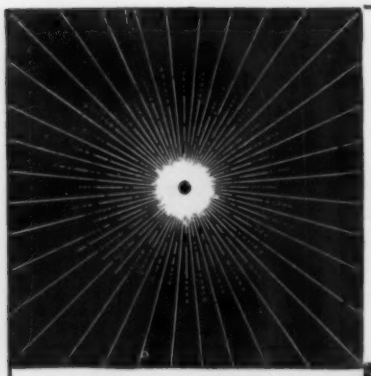
Standard Oil Official Promoted

The Standard Oil Company of New Jersey, 26 Broadway, New York, has announced the promotion of Joseph S. Helm, Manager of the Asphalt Department of the Standard Oil Company of Louisiana and located at New Orleans, as General Manager of Asphalt Sales at home and abroad for the Standard Oil Company of New Jersey. C. G. Sheffield, until recently in charge of the Asphalt Department, Standard Oil Company of New Jersey, has been placed in charge of sales in the Lubricating Department. Under Mr. Helm all the asphalt sales work of the New Jersey Company will be centered at 26 Broadway, New York.

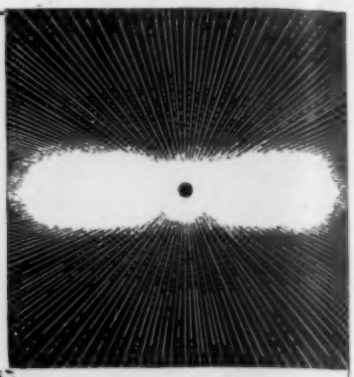
With his transfer to the Lubricating Oil Department as Manager of Sales, Mr. Sheffield retired as President of the Asphalt Association, a position in which he had served the asphalt industry most effectually for the last two years.

White Joins Youngstown Company

The Youngstown Boiler & Tank Co., Youngstown, Ohio, has announced that O. C. White, formerly contracting engineer for the Pittsburgh Des Moines Steel Company, has become Vice-President of the Youngstown organization. Prior to his connection with the Pittsburgh-Des Moines Steel Company, he was for ten years associated with the United Iron Works of Kansas City, Mo.

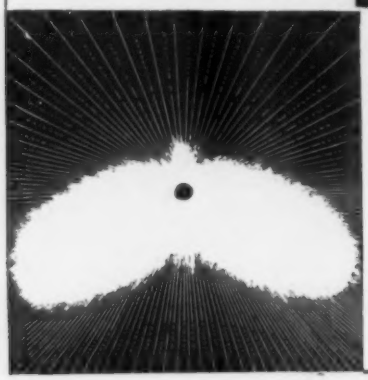


Light distribution of bare lamp

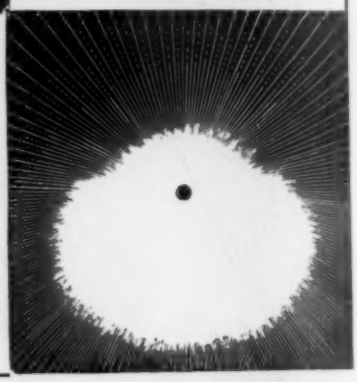


Light distribution of Holophane Asymmetric Refractor—2-way type

Light distribution of Holophane Asymmetric Refractor—4-way type



Light distribution of Holophane Asymmetric Refractor—Bilux type



Light distribution of Holophane Asymmetric Refractor—Dome type

All diagrams show the light distribution as viewed from above.

Most street lighting engineers specify

HOLOPHANE
ASYMMETRIC UNITS

Holophane Company, New York and Toronto

FEDERAL TEAR GAS BILLY BEING USED BY POLICE OFFICER ON TWO BURGLAR SUSPECTS

An Indispensable Need in Law Enforcing

Consideration for the lives of passersby and for the suspect himself has cost many a police officer his life. He withheld his fire until the last second and the suspect shot first. There is no need to hesitate when shooting Federal tear gas, made by the Federal Laboratories, Inc., Pittsburgh, Pa. Unexpectedly gassed from a billy, grenade, or gas gun, the lawbreaker is helpless. Temporarily blinded and without self-control, he thinks only for his own safety, drops his gun and instinctively feels for his eyes. All thought of resistance or deliberate action has gone.

A mob of any size can be quickly dispersed, without cracked heads or gunshot wounds, with the non-explosive Federal hand grenade, which functions similarly to the standard U. S. Army grenade. With it, one policeman can safely rout a score of barricaded lawbreakers from their cover without exposing himself to gunfire.

The Federal gas billy is a superior weapon for watchmen or policemen to use at short range or in a hand-to-hand struggle. It can be used at a radius of from eight to twelve feet and continues to shoot for approximately two to three seconds. Because of this and its effectiveness without taking accurate aim, one officer can easily overpower a number of unruly suspects.

The mechanical billy is made of high-grade aluminum coated with hard rubber and is operated by a slight movement of the thumb, which releases the safety and presses the trigger. The chemical is contained in a small cartridge which is easily inserted in the billy, and upon discharge the gas shoots out of the end affecting anyone in its path. As it shoots away from the user, he is not affected. The electric billy has all the shooting qualities of the mechanical billy, but it differs in construction in that it is considerably shorter and therefore easier to carry in the pocket. The barrel is of thin steel covered on the outside with high-grade leather. By pulling a safety, the operator can press the trigger which completes the circuit from a small battery in the handle and fires the cartridge. Because of strong construction, both the mechanical and the electric billy can be used at all times as regular billies.

A Sidewalk Snow Removal Outfit

A Fordson sidewalk patrol equipped with a snow-plow has been developed by the New England Structural Products Company, Everett, Mass. The Fordson model of the N-E sidewalk snow-plow has an all-steel moldboard reinforced with steel ribs and strongly braced against collapse. It is carefully shaped to roll and turn over the snow from the walk into the gutter. A flat steel draftboard set slightly toward the center is used. This builds a bank to work on and assists in taking care of the side draft caused by movement of snow entirely in one direction. The draftboard is extended beyond the moldboard to reinforce the nose runner and to increase side draft resistance. The runner iron for the moldboard and draftboard are of high-grade steel and are easily renewable when worn. The cutting blade is of extra heavy stock and is renewable. It is set one inch above the ground for clearance on uneven sidewalks, brick paving, etc.

The bolster rides on a 2-inch trunnion pin and the front end of the sled and forms the connecting link between the sled and the plow. It is attached to the plow by means of a long hinge-pin and has a socket which receives the raising handle. When the handle is depressed by the operator, the nose of the plow is raised and the bolster tilted, so as to lift the single right-hand wing of the plow clear of the ground. The sled consists of a double channel steel frame connected to the tractor with a coupling-pin at the tractor drawbar. There is an extra-large platform at the rear of the frame to carry an extra man when needed. The front

Profit

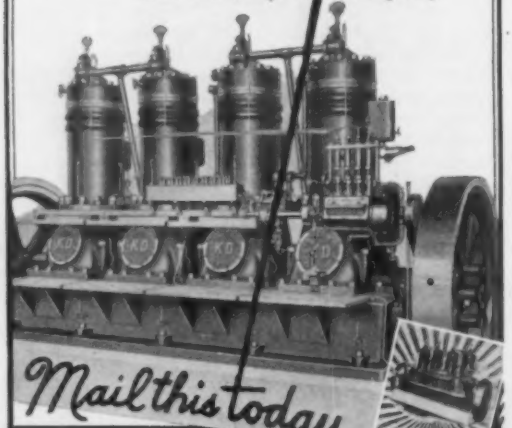
The difference between profit and loss

can often be found in your power-plant. Excessive power bills may be consuming profits that are rightfully yours.

If you want to turn present power losses into profit—to lower your cost of production and at the same time increase the efficiency of your plant—clip the coupon below, attach it to your letterhead and mail it today.

We will tell you how the Anderson Diesel Engine will pay for itself in your plant, and how easy it is to own one.

ANDERSON DIESEL



Mail this today

Anderson Engine and Fdry. Co.
Anderson, Indiana.
I am interested in knowing more about the Anderson Diesel Engine and its application to my business.
Name.....
Address.....
Horse-power required .....

Everywhere

—cities big and small are installing R-S Sanitary Drinking Fountains in parks, playgrounds and streets. Millions of people now drink in public places without danger of contamination.

Outstanding Advantages

—lips can't touch the nozzle—the "Vertico-Slant" stream makes it impossible for water to fall back upon the jet.

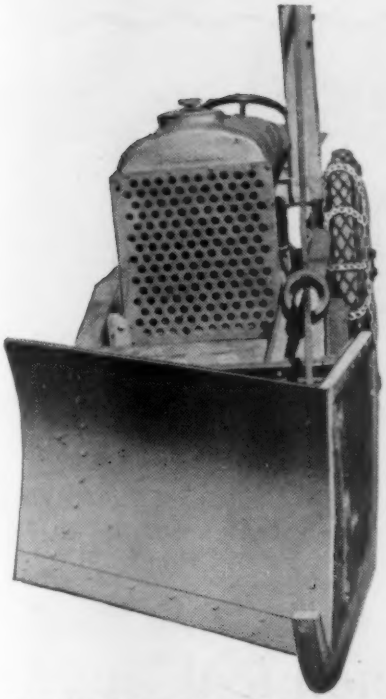
—clear, fresh water forever flows—no places where germ-laden mouths can spread disease.

The R-S Line includes Sanitary Drinking Fountains, Bath and Plumbing Fixtures and Supplies.

Write for catalog with complete information.

RUNDLE-SPENCE MFG. CO.
53 Fourth St. Milwaukee, Wis.

RUNDLE-SPENCE



SNOW-PLOW WITH SINGLE WING FOR SIDEWALK WORK

of the sled is supported by two runners giving a three-point suspension. These runners are made of one-piece high-grade steel and are designed to lift the sled and tractor over curbstones. They are rolled on the bottom to permit slide slip when turning.

This outfit is flexible and easily manipulated, going either up or down over curbstones. Standard Fordson rubber tires or crawlers can be used with the standard model, which is 58 inches wide. A special narrow-tread tractor can be used for narrow sidewalks.

A New Non-Slip Grating

The new Security grating manufactured by the Blaw-Knox Company, Pittsburgh, Pa., represents a distinct departure in manufacturing methods from the usual type of non-slip gratings. It is made by means of a resistance welding process in which longitudinal bars and crossbars are welded into one-piece construction. The full value of the metal is utilized, there being no slots or rivet holes to detract from the strength of the structure.

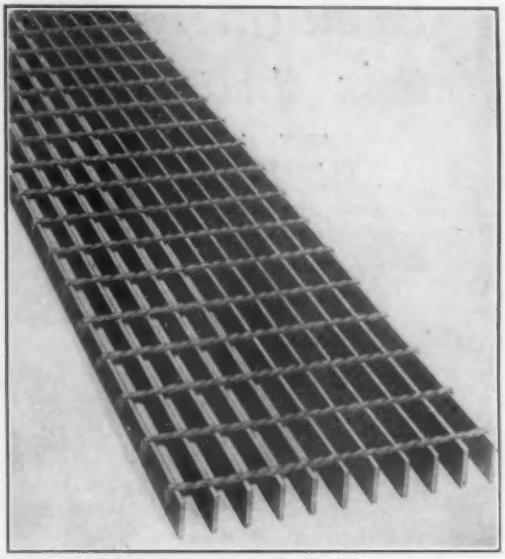
In a series of tests first conducted at Columbia University, New York, and lastly under the auspices of the Pittsburgh Testing Laboratory, this Security grating showed remarkable strength.

The twisted crossbars are practically positive in preventing slipping, as more than one of them is always in contact with each shoe of the person crossing a section of the grating, presenting a surface on which slipping is practically impossible. The crossbars are slightly raised above the level of the longitudinal bars, so that the foot is at all times in contact with the non-slip surface.

The appearance of the grating is shown in the accompanying illustration. The lighting qualities of this steel grating are remarkable, as there is a minimum of opaque material interposed between the outside source of light and its object below.

The use of galvanized Security grating is strongly recommended by the manufacturer, whether the grating is to be used indoors or outdoors, as the slight difference between the cost of galvanizing and painting is justified from the point of maintenance cost and appearance. Two repaintings, or at the most three, will cover the additional cost of galvanizing, and painting must necessarily be renewed every three years at least. It is a well-known fact that proper galvanizing forms a protective coating that will last indefinitely and the ultimate economy results through the use of the galvanized grating. The attractive appearance of the galvanized grating is also a factor to take into consideration, the galvanizing giving a surface which reflects light and thus increases the lighting capacity of the grating, whereas dark paint absorbs light rays which encounter its surface.

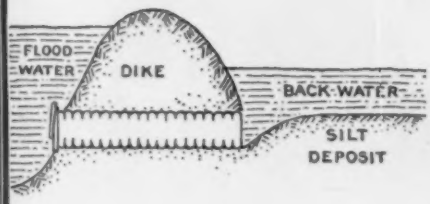
Standard Blaw-Knox Security grating contains eleven longitudinal bars to the foot, and the crossbars at the top are spaced on 2½-inch centers. The longitudinal bars are ⅛- to 3/16-inch thick as required, and the crossbars are of sufficient section to properly brace and develop the strength of the longitudinal bars.



THE NEW BLAW-KNOX NON-SLIP GRATING

The Relay Motors Corporation

The Relay Motors Corporation, Wabash, Ind., recently incorporated to take over all the assets of the Commerce Motor Truck Company, of Ypsilanti, Mich., and Service Motors, Inc., Wabash, Ind., has announced the officers of the amalgamated company. W. R. Bassick, Chairman of the Board of Directors of the new company, is known to the automotive world as former Vice-President of the Bassick Company. G. L. Gillam, President of Relay Motors Corporation, was President of Service Motors, Inc., prior to the amalgamation. M. A. Holmes, Vice-President in charge of sales, was formerly Director of Sales for the Commerce Motor Truck Company and was Vice-President and Sales Manager of the Republic Motor Truck Company. S. E. Houston is Advertising Manager of the new company.



Reclaim low lands and marshes this practical, economical way

MANY city officials, property owners and engineers are amazed to learn the ease and economy with which land may be reclaimed with Armco pipe and Calco Automatic Drainage Gates. Thousands of acres have been reclaimed in this way—salt marshes and tide-water land—swamps and river bottoms.

Often it requires across the lower end of the swamp only a low levee pierced by ARMCO Culvert Pipe, fitted with a Calco Gate. Normally, drainage water flows outward through the pipe. During flood conditions the Calco Gate closes and the silt-laden flood water backs up behind the levee depositing its silt and building up the land AUTOMATICALLY.

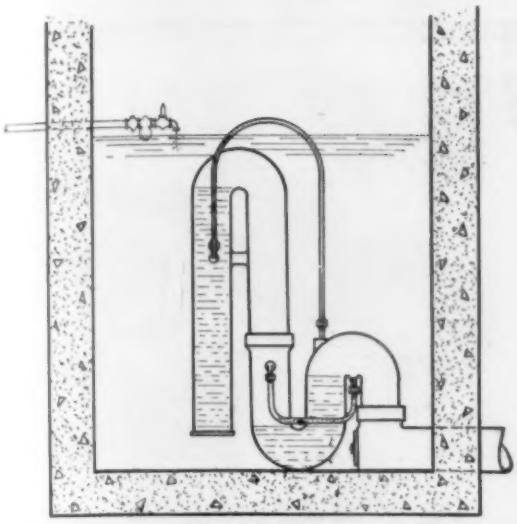
Reclaiming low lands is only one of the many practical uses for Calco Gates—these gates are equally advantageous in preventing backflow from floods, controlling water levels in parks and pools, and protecting outlets of storm sewer systems.

Our booklet "8 Major Uses of Calco Gates" gives more information on this interesting subject, or an engineer will gladly call and make recommendations on specific requirements.

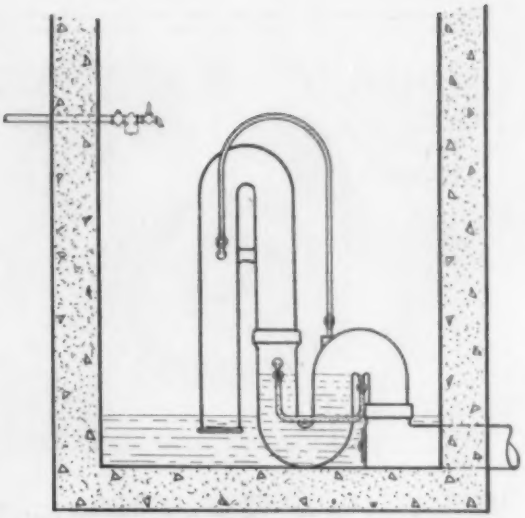
ARMCO CULVERT MANUFACTURERS' ASSOCIATION
Middletown, Ohio

CALCO

Automatic **Drainage Gates**



SUMTER SIPHON INSTALLED IN TANK FOR FLUSHING SEWERS
Tank full, siphon ready to discharge



SIPHON FOR SEWER FLUSHING WHEN DISCHARGE IS COMPLETED AND TANK READY TO FILL

A Flushing or Dosing Siphon for Sewers or Sewage Disposal Plants

The Sumter Super-Siphon made by the Sanitation Corporation, 165 Broadway, New York, consists of a siphon which discharges through an S-trap into a plugged tee at the end of the sewer with the addition of two pipe loops, one of which, the air loop, connects the uptake of the siphon with the air chamber of the S-trap, while the other, the water loop, connects the downtake of the siphon with the air chamber. It is the addition of these two small pipes that makes the apparatus distinctive.

For sewer flushing the siphon is placed in the bottom of a tank alongside the wall, where it is out of the way. In case the sewer line is extended, the siphon can be easily removed and relocated. The plugged tee allows access to the sewer for rodding or cleaning without disturbing the siphon.

In operation, whether this siphon is used in a tank for flushing sewers or for dosing sand beds, contact beds, or sprinkling filters (in which case it is located outside the tank), the air loop allows air to be expelled from the siphon into the air chamber of the S-trap until the water reaches the level of its connection to the uptake. After that, the air loop is sealed and the trapped air in the siphon is compressed between the rising column of water in the uptake and the surface of the water in the trap. Continued rise of the water-level creates sufficient pressure in the trapped air to blow the water out of the water loop and let the trapped air escape to the air chamber and through to the sewer. This escape of the air is, of course, immediately followed by the discharge of the water or sewage through the siphon. Up to this point the air seal is absolute and no discharge takes place. Discharge goes on until the water-level in the tank falls below the top of the sewer. At this point air from the sewer comes up through the air loop and breaks the flow of water. This breaking is gradual and insures that at the end of each flushing discharge the S-trap and the water loop shall be full of water instead of being emptied into the sewer. Thus the water seal for the next filling is automatically established.

When the Sumter Super-Siphon is installed for dosing sand beds, contact beds, and sprinkling filters, an elbow is added to the intake, and an elbow is substituted at the discharge end for the plugged tee, the siphon being entirely outside of the tank from which it draws the sewage.

Indian Motocycle Company Takes Over Ace Plant

The Indian Motocycle Company, Springfield, Mass., has just announced that a transaction has been closed by which all merchandise, tools, equipment, manufacturing and patent rights of the Ace motorcycle, a four-cylinder machine produced by the Michigan Motors Company, Detroit, Mich., has become the property of the Indian Motocycle Company. The Ace motorcycle has been manufactured for a number of years and is equipped with a four-cylinder power-plant, which is in marked contrast to the Indian Motocycle, the latter having been confined to power-plants with single and twin-cylinder types since its advent in 1901.

Weed Extermination for Streets, Roads, and Paths

Quick and economical extermination of weeds and undesirable vegetation infesting highways, roads, drives, and paths may now be safely accomplished without delaying other important work. According to the Chipman Chemical Engineering Company, Inc., Bound Brook, N. J., manufacturers of Atlas non-poisonous weed killer, although chemicals have been applied in general railway roadbed maintenance for a number of years, this type of weed control for highways and general civic enterprises has been impractical heretofore because of the poisonous nature of the chemicals utilized. The proposition of utilizing a toxic poison to treat a strip of weeds along fences, roads, or ditches likely to be frequented by domestic animals was dangerous, and chemical control was restricted to fenced area only. According to the manufacturer, two men, properly applying low dilution Atlas non-poisonous weed killer with simple, inexpensive atomizing equipment may easily and safely treat one mile of densely vegetated roadway in one day.

They're Speaking to the Mayor Again

EVERYBODY jolted and cussed when they drove over this street. Tourists dodged a hole here and a bump there, and they said uncomplimentary things about the street and the town and all its environs. On rainy days agile pedestrians dodged to escape the muddy spray as some daring driver navigated the chuck holes.

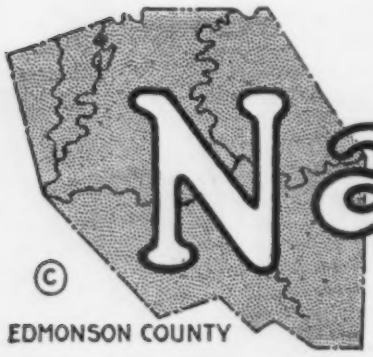
Then the city resurfaced this old brick street with Natural Rock Asphalt and—

Now motorists glide over a smooth, resilient pavement. The people are speaking to the Mayor and Aldermen again—just like they did before election. Traffic has doubled on this street. Store fronts are repainted and attractively decorated.

The cost was less than one-half that of a new pavement. Merchants say the improvement paid for itself the first year in saving of dust and dirt. They would not go back to the old "bump the bumps" for ten times what it cost.

Write for information on resurfacing old brick, concrete, asphalt macadam and gravel. Ask for Booklet AC-3.

Natural Rock Asphalt Corporation
Incorporated
Owensboro, Kentucky



Natural
KENTUCKY
ROCK ASPHALT

MUNICIPAL PLAYGROUND IN ORURO, BOLIVIA

Playgrounds in South America

The accompanying illustration shows one section of the municipal playground in the city of Oruro, Bolivia. The officials of Oruro recognize the necessity of a recreation center. To purchase equipment of this nature in the United States, foreign cities have to pay extra for the necessary boxing for ocean transportation, as well as ocean and inland freight charges, marine insurance, import duties, etc. Because of their desire to install American equipment, they are willing to pay practically twice as much as municipalities in our country.

The complete equipment for this playground was furnished by the American Playground Device Company, Anderson, Ind., as follows: one playground slide with two 20-foot chutes; one playground slide with one 16-foot chute; one set of six swings; one kindergarten box swing set of four swings; two outdoor gymnasium sets comprising swings, trapeze, horizontal bars, flexible climbing ladder, metal climbing pole and aluminum flying rings; two horizontal ladders; one teeter ladder; one ocean wave; two seesaw outfits of five boards each; six kiddies' lawn swings; and one giant stride.

The layout used was that suggested by the manufacturer, providing separate divisions for boys, girls, and children of kindergarten age.

Full-Crawler Company Changes Name

The Full-Crawler Company, 500 Clinton Street, Milwaukee, Wis., has announced the change of its name to the Trackson Company, by which it will be known in the future. The change was made in order that the company's dealers and customers might more easily link the company name with that of its product, the Trackson Full-Crawler for the Fordson tractor. The Trackson Company remains a division of the George H. Smith Steel Casting Company and retains the management, organization, and personnel of the former Full-Crawler Company.

Tests of Road-Guard Fencing

One of the first scientific investigations of the value of road-guard fencing in saving life on highways was made by William J. Putnam, Assistant Professor of Theoretical and Applied Mechanics at the University of Illinois, for the Cyclone Fence Company, Waukegan, Ill. These tests were undertaken to determine, if possible, to what extent the physical properties of the wires composing Cyclone chain-link road-guard fabric are damaged by the forming of the individual links of the fabric and also to determine the shock-absorbing qualities or energy absorption of these woven fabrics.

The results of the first test showed that the physical properties of the wire are slightly damaged by the process of forming the pickets, but that the initial stresses thus produced are largely removed by the annealing which takes place during the galvanizing of the pickets. This conclusion is further borne out by the results of the second test, in which practically the full shearing strength of the wire was developed. The third test showed that the energy-absorbing qualities of the fabric are not seriously affected by keeping the fabric from narrowing down, and, further, that ordinary stapling to the post will not prevent such narrowing. In fact, such stapling would simply serve to furnish a little more energy absorption due to the work done in pulling the staples and sliding the fabric across the post.

The second test showed the enormous energy-absorbing qualities of the fabric, an ultimate of about 3,200 foot-pounds per foot of fabric which is stretched to that point. This is further brought out by considering a few hypothetical cases. The energy absorption of a 3 x 12-inch yellow pine plank on a 10-foot span even with the most liberal assumptions of high stress and high deflection cannot exceed 10,000 foot-pounds. It is probably true that more energy than this would be absorbed under actual conditions, but that will be due to the yielding of the posts and the deformation of bumper, frame, tires, etc., of the car. With the chain-link fabric tested, the energy absorption

Cyclone Fence

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MUNICIPALITIES throughout America regard Cyclone Fence as an indispensable part of modern equipment for institutional property.

Cyclone Fence enhances the beauty of buildings and grounds. Promotes order and system. Bars all outside annoyances. Reduces upkeep expense. Built in handsome designs, in wire and wrought iron.

Phone, wire or write for complete information.

Cyclone Fence Company

***Main Offices:* Waukegan, Illinois**

Works and Offices:
North Chicago, Ill. Cleveland, Ohio
Newark, N. J. Fort Worth, Texas

Branch Offices in All Principal Cities

Pacific Coast Distributors: Standard Fence Co., Oakland, Calif.; Northwest Fence & Wire Works, Portland, Ore.

The Mark of Dependable Property Protection

Cyclone Property Protection Pays

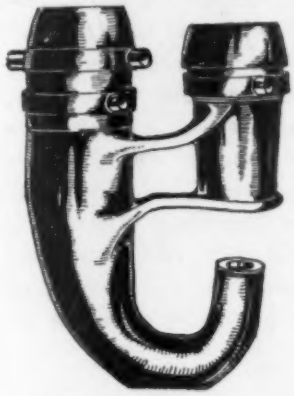
Cyclone Wrought Iron Fence

would not be confined to one or two 10-foot panels, but would extend both ways from the point of impact as far as might be necessary. In this case also the fabric would be assisted by the yielding of the post and the sliding of the fabric by the posts which did not tip over or break off.

In stopping an automobile or truck the road-guard must absorb the kinetic energy of the moving vehicle. For example, a 4,000-pound car moving with a velocity of 40 miles per hour produces an energy of 213,300 foot-pounds. This energy could be absorbed by 70 feet of Cyclone chain-link road-guard fabric without breaking. Some of the energy would be absorbed by the yielding or breaking of posts, and the rest would be absorbed by the permanent deformation of some one hundred feet or so of fabric. Of course, no estimate can be made of the energy absorbed by the friction across posts or by posts yielding, as no two posts will ever be set exactly alike and even the same post setting would vary with weather conditions. With heavier cars or higher speed, or both, it would simply be a case of stretching more fabric.

A New Pump for Dewatering Flooded Manholes

A new pump which has no moving parts and which consists of practically a single casting with no suction hose, vacuum chamber, or strainer, has been developed by the Self Propelling Nozzle Company, 97 Water Street, New York, for dewatering flooded manholes and catch-basins. According to the manufacturer, the rated capacity of the pump is 5,000 gallons per hour, using



THE VEVAC PUMP

1,000 gallons of water with 25 pounds pressure at the pump. For dewatering flooded manholes, this Vevac pump is hooked up to a fire-hydrant, and the discharge hose is attached to the outlet. The pump is then lowered into the manhole or catch-basin, and the discharge hose is laid to a gutter leading to an intake below the flooded manhole. The water is turned on, and the manhole or catch-basin is quickly dewatered.

The Pittsburgh Equitable Meter Company

The Equitable Meter and Manufacturing Company has announced a change in name to the Pittsburgh Equitable Meter Company coincident with the purchase of all assets of the Pittsburgh Meter Company of Pittsburgh, Pa. The Pittsburgh Equitable Meter Company will continue the manufacture of water-meters, gas-meters, regulators, and other products which each of these companies has developed through more than a generation of successful business experience.

Changes in Sales Promotion Department of Foamite-Childs

The Foamite-Childs Corporation, Utica, N. Y., has announced a recent change in its Sales Promotion-Advertising Department. Norman F. Kimball, Assistant General Sales Manager, has been placed in charge of all advertising and sales promotion work. In addition to a broad experience in ability and sales promotion and advertising work, Mr. Kimball holds a technical degree in fire protection engineering. For a number of years he was connected with the Underwriters' Laboratories, and has been connected with the manufacturing and engineering departments of the Foamite-Childs Corporation.

Heil Opens New Detroit Office

The Heil Company, Milwaukee, Wis., has announced the opening of a branch office, sales and service station in Detroit. Roy L. Diercksmeier, formerly Manager of the Heil Company branch in Minneapolis and St. Paul, will supervise the organization of the new Detroit district. A stock of steel dump bodies, hydraulic hoists, hand hoists and compartment truck tanks will be carried in Detroit, as well as a stock of service parts.

Talbot Becomes Director of Sales for Koehring

The Koehring Company, Milwaukee, Wis., manufacturer of pavers, mixers, gasoline shovels, cranes, and draglines, has announced the appointment of K. H. Talbot as Director of Sales in charge of domestic and foreign sales. For five years, from 1919 to 1924, Mr. Talbot was associated with the company as Manager of Field Service. He has resigned as Manager of Cement Sales of the Cowham Engineering Company, Chicago, Ill., to accept this appointment.

Wilder Acquires Control of Stockland and Lyle Companies

Control of the Stockland Road Machinery Company and the Lyle Culvert Company, both of Minneapolis, Minn., has been acquired by A. B. Wilder, road equipment manufacturer of that city. Associated with Mr. Wilder in his active management of both companies is Cal Sivright, present Vice-President and General Manager of the Stockland company.

The Lyle Culvert Company was organized by Mr. Wilder in 1905. The Stockland Road Machinery Company was also organized in 1905 and was acquired by the Lyle Company in 1920. The latter company does a national and foreign business in road machinery as well as a large export business to Australia, South Africa, South America, Cuba, Norway, and Canada. Two new units were recently added to the company's main plant in Minneapolis to take care of its expanding business.

ON THE GULFPORT SEA-WALL

When Woods Brothers were building the Gulfport Sea Wall at Gulfport, Miss., they faced the problem of placing a continuous belt of concrete on the wall, 75 miles in length. Equipment was needed that would not only bring the wet concrete to position on the wall but would also permit of easy maneuvering, as the work progressed. A portable crane was tried but was replaced by a 24-ft., 24-in. belt, Northern Conveyor, because of its advantages in economy, speed and easy portability.

This is just another instance of the adaptability of Northern Conveyors to the job. Whether it's handling concrete, sand, gravel, stone, crushed rock, brick, coal, ashes, mortar, lime or earth—anything and everything in loose and semi-loose material—a Northern Conveyor handles it quickly and cheaply. And because of their "Built Better" construction, Northern Conveyors can be had in all lengths up to 100 ft. maximum and in six respective belt widths; we can build you a conveyor suitable for any job, large or small.

Write for and keep the Northern Catalog on file.

NORTHERN CONVEYOR & MFG. COMPANY

JANESVILLE, WISCONSIN

When writing to Advertisers please mention THE AMERICAN CITY—Thank you.

DETROIT MOWER OWNED BY CITY OF JACKSONVILLE, FLA.

Motor Mower in City Service

In the spring of 1926, the city of Jacksonville, Fla., purchased a Detroit mower for use with a Fordson tractor. This mower, manufactured by the Detroit Harvester Company, 5450 Jefferson Avenue, West, Detroit, Mich., has been used throughout the city during the last year, and also particularly in cutting the vegetation on vacant lots around the city. A large part of the cutting was in what is called wild coffee weed, which is very dense and extremely hard to cut. According to George G. Jones, Superintendent of the Jacksonville City Garage Department, the Detroit mower handled this work easily and stood up under the severe punishment. He also reports that after completing a hard season's work, the machine is in good shape and ready to go on the job again next season.

A Screenless Centrifugal Sewage Ejector

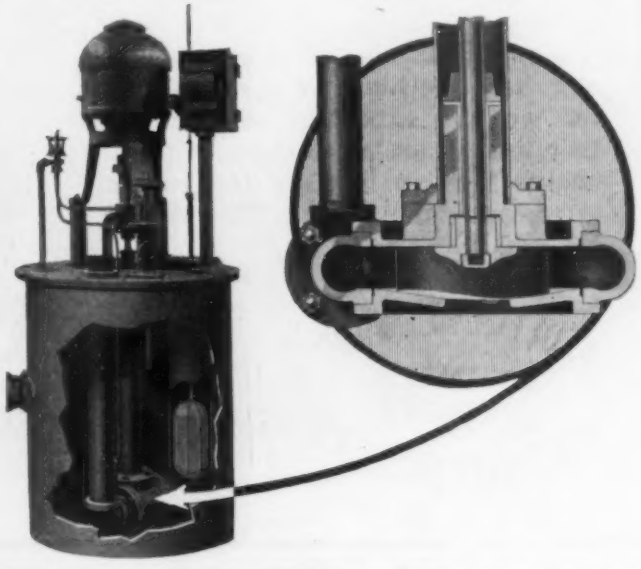
Several years ago the Yeomans Brothers Company, 1417 Dayton Street, Chicago, Ill., developed a non-clogging centrifugal sewage pump for municipal service. The design of the pump was such that it would readily pass all types of solids, thus eliminating the use of screens and the consequent necessity for frequent cleaning, an expensive and unpleasant task. The complete acceptance of this feature on the part of users prompted the company to go a step further with the non-clogging equipment, and it was then adapted to city building service.

The chief feature of the new screenless ejector is the non-clogging impeller which passes all kinds of solids through the pump. It is designed with unusually wide blades, large water passages, and rounded forward blade ends. There are only two waterways in the impeller and no hub or vanes obstructing the entrance.

Recently a very severe test was made of one of the screenless ejectors installed in the new Parker House in Boston. This is duplex equipment, each unit having a capacity of 350 gallons per minute. Two pieces of burlap measuring 12 inches by 18 inches were thrown into the pump receiver. The receiver was pumped dry and refilled and more cotton and burlap thrown into it. The basin was pumped dry and again opened, and it was found that everything had been passed through the pump. In a second test more than double the quantity of material was used. So much burlap was thrown in that it was enough to make a suit of overalls, and it was in good-size pieces. The pump emptied the basin, and on being opened was found clear.

Culvert Association Opens District Offices

The Armco Culvert Manufacturers Association, Middletown, Ohio, has opened a new district office at Lincoln, Nebr., with Mont C. Noble, formerly Chief of Bureau of Roads and Bridges of Nebraska, in charge. This office covers Nebraska, Kansas, Iowa, and Missouri. A district office has also been opened at East Point, Ga., with Tom M. Neibling, formerly Research Engineer, Georgia State Highway Department, in charge, to cover Alabama, Florida, Georgia, Louisiana, Mississippi, Tennessee, North Carolina, and South Carolina.



YEOMANS SCREENLESS SEWAGE EJECTOR FOR BUILDING SERVICE

The First Aid in Spring Street Cleaning Is HUNTSVILLE HICKORY

When it comes to cleaning the streets in the early spring and during the months when there is a bountiful supply of rain with its attendant accumulation of drifts on the pavements, HUNTSVILLE HICKORY has proven its superiority for many, many years.

It was the standard material for this work before the motor sweeper was invented and it is still the standard. Its elastic spring, uninjured by moisture, its dense body which resists the grinding wear of water and silt or sand, its uniformity of quality and certainty of supply have made it the "sure thing" in every city where mechanical sweeping has solved the street-cleaning problem.

Made in America from the choice green trees of America's finest variety, the mountain Shell-bark Hickory, by American labor and American machinery, and delivered to American cities without danger of damage through long or improper storage, it represents always an honest dollar's worth for every hundred cents invested.

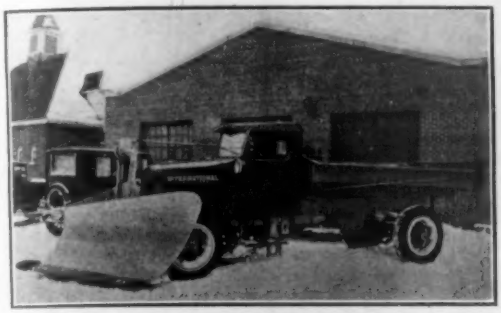
Every bale bears the stencil mark showing that it is genuine HUNTSVILLE HICKORY. By specifying this material when ordering, either from the manufacturer of your street-sweeping equipment or from your jobber of municipal supplies, you will have nothing to worry about, for we will cheerfully replace any bale that is not satisfactory, without charge. There is no string to our guarantee of ABSOLUTE SATISFACTION.

FAULTLESS FIBER
HUNTSVILLE
HICKORY
FOR STREET SWEEPERS

HUNTSVILLE FIBER and VENEER WORKS
HUNTSVILLE, ALABAMA

The Year-Round Use of Motor Trucks

Motor trucks are playing a bigger rôle every year in keeping the highways of the thirty-six so-called snow states open throughout the winter. The investment in improved highways is now about nine billions of dollars. The major portion of this investment can no longer be "frozen" for several months each year. The country is too dependent on automotive transportation to permit such an uneconomic condition. Every year the importance of attacking the snow as soon as it



INTERNATIONAL HARVESTER TRUCK EQUIPPED WITH SNOW-PLOW

begins to fall and removing it as fast as possible is emphasizing itself to road officials. Numerous county, city, and state governments are now completely organized to bring about a quick clean-up of the main arteries of traffic after each major snowstorm. Heavy-duty motor trucks, equipped with suitable plows or scrapers, are particularly well adapted to do this snow-removal work.

In the first illustration is shown a 3-ton truck made by the International Harvester Company of America, Inc., 606 South Michigan Avenue, Chicago, Ill., equipped with a V-type plow and owned by the county of Marathon, Wis. This truck has accomplished big results this winter in clearing main county roads of snow. The plow is 36 inches high at the nose and has a cutting width of 9 feet 6 inches, but since some of the snow at the

SAME TRUCK WITH 12-FOOT SCRAPER

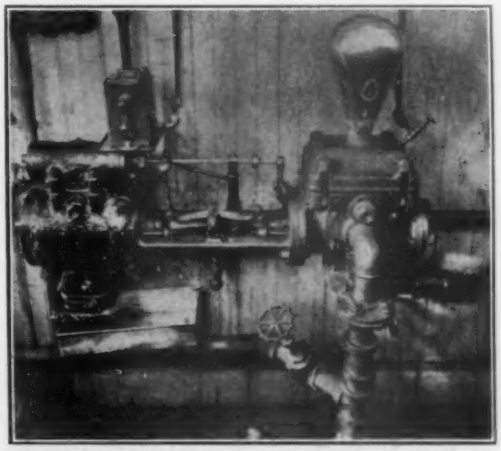
sides falls back, the actual cleared width is about 8 feet 6 inches. In bucking snow, the motor truck travels on an average of 9 to 10 miles an hour, and during snowstorms it is worked night and day. When it is desired to clean a full width of road, the motor truck is driven on one side of the road and back on the other.

In the second illustration this same motor truck is shown equipped with a 12-foot scraper attached underneath the truck at an angle of 45 degrees for road maintenance work. When the truck is thus utilized, the load of gravel is carried along to fill sink-holes in the road. In this way the motor truck is available for keeping the roads in good condition for travel throughout the year.

Boiler-Feed Pump in Active Service for Fifty Years

A Worthington-Knowles Simplex boiler-feed pump made by the Worthington Pump & Machinery Corporation, 115 Broadway, New York, was installed in 1876 in the Marshalltown, Iowa, water-works and used day and night on boiler-feed service until 1922. For the first 44 years it was the only feed-water pump in the plant, a spare unit not being purchased until 1920. In 1922 the old pump was placed on light pressure service, but was used on boiler-feed service from time to time while the new pump was being overhauled or repacked.

Late in 1926, when the larger unit was required, the old pump was removed from service and replaced by a larger Worthington pump. George L. Suter, former operating engineer of the plant, states that the valve motion was replaced only once. This and other repairs did not amount to over $100 for the 50 years that the pump was in service.



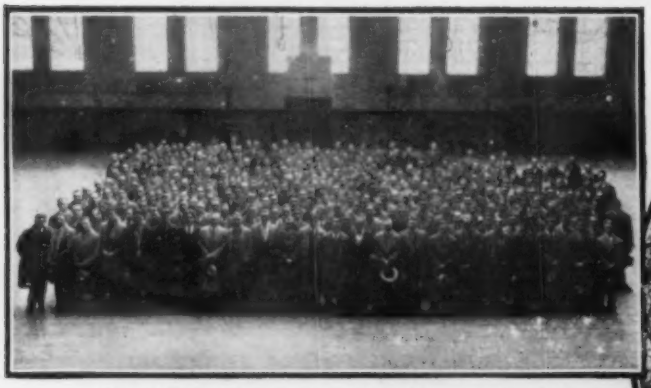
WORTHINGTON-KNOWLES BOILER-FEED PUMP INSTALLED IN 1876 IN THE MARSHALLTOWN, IOWA, WATER-WORKS

Miami Beach Installs New Police Signal System

A modern 15-box police signal system has just been placed in operation at Miami Beach, Fla. The apparatus in the new system is of standard Gamewell type, made by the Gamewell Company, Newton Upper Falls, Mass., and consists of one 4-circuit Type-B control desk, 15 report boxes, 166 cells of F. I. P. battery, one 60-inch 4-shelf metal battery rack, one motor generator set, 15 flashlight controllers, 15 combination bell-light recall units, and two official telephone sets.

The new system will enable the present police force to cover a larger area more efficiently by providing for the periodic reporting of policemen, at which time they are given instructions and report their progress. Through the medium of the recall equipment, any one policeman or the entire force on duty can be assembled within a few minutes by simply operating a switch on the control desk at headquarters.

The only school of its kind



Student body of Davey Institute of Tree Surgery, Kent, Ohio, numbering nearly 300 men — carefully selected and scientifically trained for the field force of The Davey Tree Expert Co.

Teaching Davey men the science of proper and effective spraying

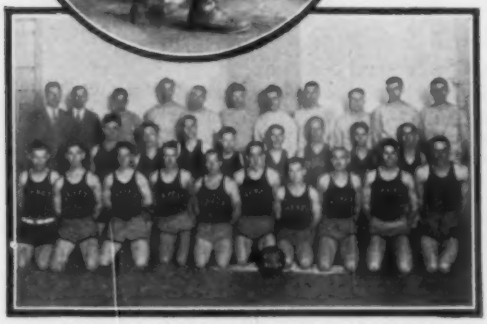
Teaching Davey men the science of the care of tools and instruments

Indoor forest of Davey Institute of Tree Surgery, where the Science of Tree Surgery is taught in actual practice. No experimenting is done on the client's trees

JOHN DAVEY

Father of Tree Surgery

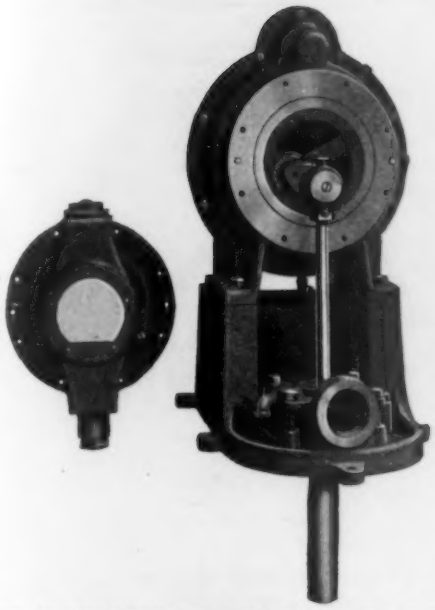
Reg. U. S. Pat. Office



Basket-ball squad of the Davey Institute of Tree Surgery. Adequate attention is given to athletics and physical training

Section of one of the laboratories of the Davey Institute of Tree Surgery. Thorough, scientific training is given by laboratory and class room work

Operated by The Davey Tree Expert Co., Inc., 793 City Bank Bldg., Kent, Ohio, to provide scientifically trained Tree Experts for the service of its clients. Branch offices and local representatives in all principal cities



THE ALAMO-DORWARD ROTARY POWER HEAD

New Machine Converts Rotary Motion into Reciprocating Straight-Line Motion

A new machine which converts rotary motion into reciprocating straight-line motion in a very simple manner has been developed by the Alamo Engine Company, Hillsdale, Mich. With the Alamo-Dorward rotary power head there are no connecting rods and no crossheads. The power head consists mainly of two cylinders, one revolving inside of the other and supported and turnable on two annular roller bearings of large proportions. This machine has no center axis bearings.

The main drive gear, which is on the inside of the housing or shell, is attached to the inner rotor or cylinder. The large internal gear, as shown in the illustration, is stationary and bolted to the outside cylinder or shell. Straight-line motion is produced by compounding the throw of the crank, the crankshaft being driven by a set of internal gears on the rear end of the machine. When power is applied to the driveshaft, the pinion gear on this shaft drives the main gear, which revolves the inside cylinder or rotor. This inside cylinder carries the crankshaft and the gear on the end of the crankshaft contacts with the internal gear and rotates the crank in the opposite direction, with the result that the center of the crankpin travels up and down in a straight line and therefore requires no connecting rod or crosshead for guiding the plunger rod.

This machine is particularly adaptable to deep-well pumping and has been in use for several years under various conditions.

Joe Helm Elected President of Asphalt Association

Joe S. Helm, General Manager of Asphalt Sales for the Standard Oil Company of New Jersey, was elected President of the Asphalt Association at its annual meeting. Mr. Helm recently came to the Standard Oil Company of New Jersey from the Standard Oil Company of Louisiana. As President of the Asphalt Association, he succeeds C. G. Sheffield of New York, who served as head of the organization in 1924, 1925, and 1926. Other officers elected by the Asphalt Association for 1927 were: Vice-President, Leroy M. Law, New Orleans Refining Company; Treasurer, Herbert Spencer, Standard Oil Company of New Jersey, and Secretary-General Manager, J. E. Pennybacker, New York.

A ONE-DAY DRIVE-AWAY OF FIVE PIECES OF CHILDS "THOROUGHBRED" MOTOR FIRE APPARATUS

From left to right: a triple combination with special Foamite chemical tanks, for Mellenville, N. Y.; a triple combination with Childs soda and acid chemical tanks, for New Egypt, N. J.; a triple combination with special Foamite chemical tanks, for Lima, N. Y.; and a triple combination for Sharon Springs, N. Y.

MARCHING THROUGH GEORGIA!

TAKE the wide-awake city of Atlanta, for instance. Yet you can march through Atlanta and never get lost as long as you keep your eyes open.

For Atlanta, with its wonderful growth and expansion, realized that street and house numbering systems *must* keep pace.

Complete *renumbering* was decided upon, and naturally Premax, the world's largest, furnished the numbers.

Atlanta is one of many—perhaps we may help you. Learn more about it by mailing the coupon today.

PREMAX PRODUCTS

NIAGARA METAL STAMPING CORPORATION

Dept. AC-3

Niagara Falls New York

Niagara Metal Stamping Corporation
Niagara Falls, N. Y.

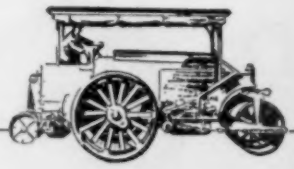
Please send your bulletin on Modern House-Numbering Methods.

Signed .....

Official (?) .....

Address .....

AC-8



ACME ROAD MACHINERY

Every job, and every part of it, should show a profit.

By using Acme-built equipment—it will!

The experience of many contractors has shown:

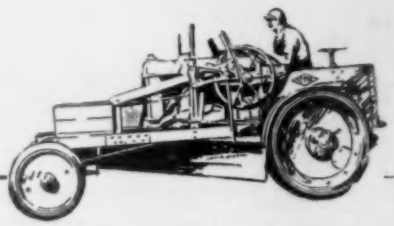
That you can safely charge off less for depreciation on equipment of Acme quality;

That the standardization of parts and notable accessibility keep repair costs down:

That Acme service helps tremendously to keep work-hours lost through breakdowns at a remarkably low point;

And that Acme simplicity and strength make for longer records of continuous service.

Write for Catalog, also for Bulletin No. 125, describing the Acme Tri-Utility Road Builder.

ACME ROAD MACHINERY CO.

FRANKFORT, N. Y.